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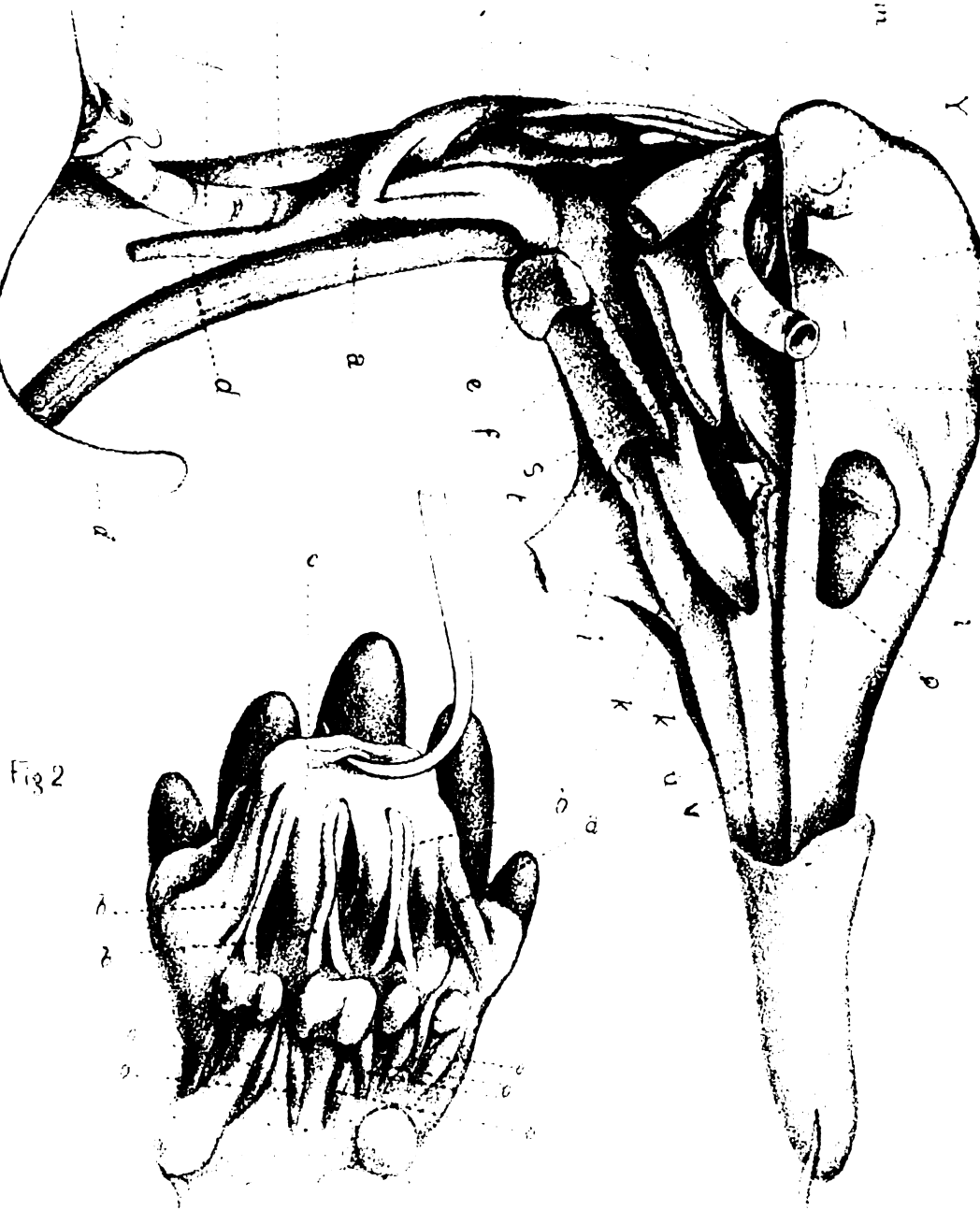
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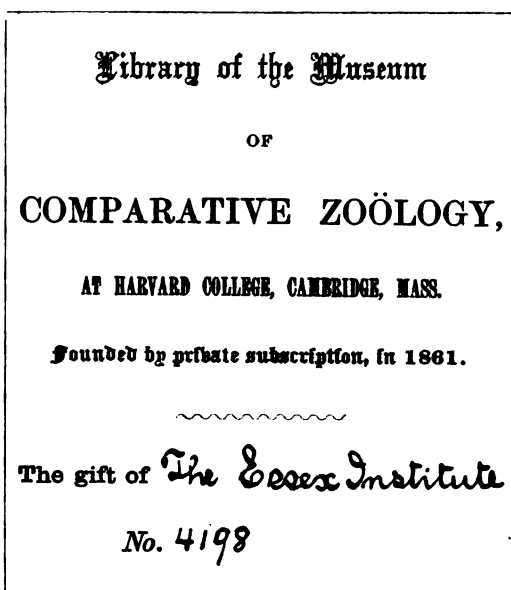
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*Bulletin of
the Essex Institute*
Essex Institute

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ESSEX INSTITUTE,
VOLUME VII.

1875.

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BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 7. SALEM, MASS., JANUARY, 1875. No. 1. .

One Dollar a Year in Advance. 10 Cents a Single Copy.

REGULAR MEETING, MONDAY, JANUARY 4, 1875.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence :—

From E. P. Boon, New York, Dec. 15; Melvil Dewey, Amherst, Dec. 21, 26; W. I. Fletcher, Hartford, Conn., Dec. 31; Daniel A. Gleason, Boston, Dec. 31; Frank E. Hotchkiss, New Haven, Dec. 27; Alfred M. Mayer, South Orange, N. J., Dec. 18; Charles Phillips, Germantown, Penn., Dec. 30; Lyon, Société d' Agriculture, Juillet 20.

The LIBRARIAN reported the following additions to the library :—

By Donation.

HOTCHKISS, F. E., of New Haven, Conn. Miscellaneous pamphlets, 8.
MERRITT, L. F. Essex County Mercury for Dec. 2, 9, 16, 23, 1874.
STETSON, CHAS., of New York, N. Y. The Erie Railway Tourist. 1 vol. 4to.
WILLSON, E. B. The Christian Freeman and Record of Unitarian Worthies, Dec., 1874. 8vo pamph.
WORCESTER COUNTY MUSICAL ASSOCIATION. Seventh Annual Festival, Oct. 19, 20, 21, 22, 23, 1874. 8vo pamph.

By Exchange.

ACADÉMIE IMPÉRIALE DES SCIENCES, BELLES-LETTRES ET ARTS, LYON. *Mémoires*, (classe des Sciences. Tome xx, 1873-74.

ESSEX INST. BULLETIN.

VII

1

INSTITUT HISTORIQUE, PARIS. *L'Investigateur*. 40 Année, No. 5, 1874.
 SOCIÉTÉ D'AGRICULTURE, D'HISTOIRE NATURELLE ET DES ARTS UTILES,
 LYON. *Annales*, 4e Série. Tomes iv, v, 1871-72. 2 pamphlets.
 SOCIÉTÉ LINNÉENNE, LYON. *Annales*. Tome xx. 1873.
 PHYSIKALISCH-MEDICINISCHE GESELLSCHAFT, WÜRZBURG. *Verhandlungen*,
 Neue Folge, Bd. vill. 1-2 Heft. 1874.
 ZOOLOGISCHE GESELLSCHAFT, FRANKFURT. *Zool. Garten* xv, Jahrg. Nos.
 1-6, 1874.
 PUBLISHERS. *American Naturalist*. *Forest and Stream*. *Gloucester Telegraph*.
Haverhill Gazette. *Ipswich Chronicle*. *Lawrence American*. *Lynn Reporter*.
Lynn Transcript. *Medical and Surgical Reporter*. *Nation*. *Nature*. *Peabody*
Press. *Salem Observer*. *Salem Post*. *Sailor's Magazine and Seaman's Friend*.

Donations to the cabinets were announced from George L. Peabody, of New York City, a rare and valuable Japanese gold obang; from Louis F. Emilio, gold bearing quartz from the Vulture Mine, Arizona, and from Charles T. Jenkins, gold bearing quartz from Ophir Hill, Grass Valley District, Nevada County, Cal.

Mr. F. W. PUTNAM, of the committee appointed at a previous meeting to prepare a memorial for action of the Institute in relation to a proposed State Topographical, Geological and Biological Survey, reported the same, which was referred to the directors, with authority to act.

ARCHÆOLOGICAL RESEARCHES IN KENTUCKY.

Mr. F. W. PUTNAM gave an account of some of his recent archæological investigations in Kentucky, made with the assistance furnished by the Peabody Museum of Archæology and Ethnology at Cambridge, while he was engaged as Ichthyologist of the Kentucky State Geological Survey, of which Prof. Shaler is chief.

Confining his remarks to researches made in the caves, and in connection with a peculiar form of burial in circular graves, he first exhibited a number of skulls and other bones found under various conditions, and described the peculiarities of each group, comparing them with

those of undoubted Mound Builders, and with those of the New England Indians. While the skulls of the New England Indians are long and narrow, those from the mounds, the circular graves, the stone graves and the caves, were of the short, broad and high type; but in the caves were found two, if not three, classes of burials, and at least two well-marked forms of skulls.

The skulls found in graves which were, as a rule, protected by slabs of stone, were, so far as his researches went, of a form resembling the high, short and broad crania of the typical Mound Builders, while those from caves that contained a large number of skeletons representing bodies that had been thrown into the caves, or perhaps skeletons which had been placed there after the flesh had decayed, were quite characteristic from the very marked depression of the frontal bone and the equally marked concavity on the anterior part of the parietals. The skulls from the "circular grave" were also distinguished from the others by their decided width and shortness, and the more vertical occipital portion.

A series of shin bones was also exhibited, to show the various degrees of flattening which existed, and to prove, as shown by the researches of others, that platycnemism, while most marked in ancient and uncivilized races, could not be taken as a special race character of any great importance.

The examination of a group of mounds near Glasgow was then described, and though no human remains were found in these particular mounds, a most interesting burial place on a hill close by may have had some connection with them. This burial place consisted of a number of circular graves, most of which had been destroyed by the cultivation of the land; but one that had been undisturbed by the plough was carefully opened. This grave

was nearly a circle of about four feet in diameter, and had been dug to the depth of about three feet. Upright slabs of limestone about three feet in height, from one to two feet in width and three or four inches in thickness, had then been placed round the hole. The bottom of the grave had been covered with pieces of shale brought from Peter's Creek, about a quarter of a mile distant. The bodies, at least ten in number, had been placed in the grave, evidently arranged in a sitting posture, in a circle, with their backs against the upright slabs. A few pieces of stone found on the surface of the grave may indicate that stones had been placed over it. If any slight earth-mound had been formed over the grave, it had been washed away, as the edges of the upright stones were projecting a few inches above the present surface of the soil. From the fact that only a fragment of pottery was found among the stones on the surface of the grave, and no implements of any kind in the grave, it may be that articles since scattered were placed over the grave. The number of these circular graves that once existed at this spot on the homestead of Gen. Jos. H. Lewis, who had taken Mr. Putnam to the place, brings up many thoughts as to their connection with the group of mounds in the little valley below them, and speculations regarding their peculiar position lead Mr. Putnam to consider them as probably indicating a peculiar mode of burial which may yet be found to be as characteristic of the singular mound-building race, as the burial under mounds is now supposed to be. The fact that all the bodies must have been placed in the grave at the same time, and, as shown by the teeth, that they were those of persons of various ages, from two children who had still the first set of teeth, to a person so old as to have many of the *alveoli* closed up, while the majority were evidently of middle age; and

also from the peculiar hole in one of the arm bones, perhaps indicating a blow with some pointed instrument, gives opportunity for speculations which cannot be proved or disproved by these silent relics of a once populous race inhabiting the beautiful country where their bones were laid so long ago that tradition of the more recent Indian tribes gives no clew to them; whence they came or whither they went, all is lost in the great mystery of the past, and only their empty heads and wonderful monuments of industry, with their implements of skill, are left to tell us of their former power. We know not if these burials indicate famine, pestilence, war, or the unholy sacrifice. We can only conjecture that they were not the graves of persons who had died a natural death.

The caves of Kentucky were often used as receptacles for the dead, and many of them contain large numbers of human skeletons; but that they were also used as at least temporary places of habitation is shown by the relics found in Salt Cave, situated near the Mammoth Cave, and belonging to the same proprietors. This cave, which is a rival to the Mammoth in the size of some of its avenues, is difficult of access. A small stream of water flows over its mouth, and runs off, through the loose rocks that have fallen from the roof of the cave, to the passage on the left. After entering the cave, the descent of a steep hill of loose rock to the right leads into a large avenue of several miles in length, the floor of which is covered with jagged rocks which have fallen from above. After climbing over this rough road for some distance, small areas are observed where the rock has not fallen from above, and where the original dirt floor or river bed is seen. In these places there are to be found quite level spots where fires have been kindled, and small piles of stone placed by human hands. Here and there, in favor-

able places, other small piles of stones are to be seen erected in such a way as to leave a small hole in their centre, and at the bottom of this hole ashes and the stubs of burnt sticks can be seen; while on some of the rocks about were found small bundles of fagots tied with bark and of a convenient size to be taken in one hand and placed in the holes of the rock piles, evidently indicating that these bundles of sticks were brought into the cave for use as lights and firewood. Farther on, in side passages and chambers, other indications of habitation were noticed, and in one small chamber, in which the foot of a white man had never stepped before, were seen on the cave earth the imprints of feet that had been shod with peculiar braided moccasins or sandals. Here were in reality the "footprints on the sands of time." The naked heel and toes, and the braided covering to the sole of the foot, have left impressions as distinct in the tenacious and heavy soil of the cave as if made but a few days previous. In these side chambers, in only a few of which Mr. Putnam's guides had been before, were found a number of cast-off sandals, very finely made of the twisted leaves of the cat-tail flag (*Typha*) braided in a careful and artistic way, identical in the manner of braiding with the straw sandals from China, though of a different shape, and having a raised portion from toe to heel, like the sides of a leather slipper, while all the ends of the braids were brought forward and united on the median line over the toes. About twenty-five of these sandal-like moccasins of various sizes and of several slightly varying designs, but all worn through at toe and heel, were found in the interior chambers of the cave. A piece of cloth more than a foot square and finely and regularly woven, probably from the inner bark of some tree, was also found. This cloth was specially inter-

esting, showing as it did that it had been dyed or colored with black stripes, and also in exhibiting at one corner a place where it had been mended by darning. The other articles found in the cave, which were exhibited at the meeting, with those already mentioned, consisted of bunches of the bark such as was used to make the cloth, and of different degrees of fineness; a number of pieces of bark-twine and rope, several showing knots where pieces had been tied together, some made of twisted strands simply, while others were of a five-strand braid, and of a different and more pliable substance than the coarser-twisted kinds; a small piece of quite a delicate fringe or tassel of neatly braided fibres; a number of reed "torches," generally burnt only at one end; a few small fragments of burnt wood, one showing the rough cutting of a flint axe; several fragments of large gourds; two flint arrow points; a few fragments of shells of *Unio*; a few feathers, probably of the wild turkey, and a portion of a wooden platter or dish. No bones of animals indicating the food of these cave people were found, and though the earth in one of the chambers had been disturbed, and looked, in several places, as if burials had been made, no human bones were discovered. Mr. Putnam intended to make further explorations in this cave, but a severe illness, brought on by exposure and fatigue in the caves, prevented him at that time from carrying out his plan. Enough was discovered, however, to show the importance of a thorough exploration of the caves in this country, both to ascertain the facts relating to their having been used as habitations and as sepulchres, and Mr. Putnam stated that it was encouraging to science to feel that the work begun by the Kentucky Survey, with the assistance given by the Peabody Museum of Archæology at Cambridge, will be continued until more is known relat-

ing to the archæology of this large and most important group of American caves.

The discovery, by the saltpetre miners of 1812-15, of bodies buried with care in some of the caves of Kentucky and Tennessee, and the numerous articles which had been found with them, was alluded to by Mr. Putnam, who stated that since his return from Kentucky he had examined the body, and what remained of the very large number of articles found with it, that was so widely known as the "Mammoth Cave Mummy" sixty years ago. This body was, in reality, found in Short Cave, situated about eight miles from the Mammoth Cave, and had been taken to the latter place for the purpose of exhibition. Mr. Putnam had visited the spot from which the body had been taken, and from the location of the grave thought that there was some evidence of the burial having been prior to the fall of the roof rock, which seems to have taken place in many of the caves in this region at a remote time. In some of the caves large stalagmites have formed over these fallen rocks, though in most of the caves where this falling has occurred the passages were dry at the time, and have so continued. He was glad to state that though these priceless relics of a former race had been sadly neglected, and many of the articles found in the grave had been lost and others had gone to decay, still enough remained at the rooms of the American Antiquarian Society at Worcester, to identify the articles found by him in Salt Cave as the same in material, design and structure as those found with the body in Short Cave, so that he had thus secured undoubted osteological characters of the race to go with the articles of clothing, etc., of the people who had made use of Salt Cave as a habitation, and he thought, from all that had been found, we could, with little doubt, class this people

among the more highly civilized and agricultural of the prehistoric races of America, and it was also very probable that Salt Cave had only been used as a temporary retreat. A number of fragments of the twine, cloth, etc., found with the body now in the collection of the Antiquarian Society, were exhibited side by side with similar ones from Salt Cave, and were seen to be of the same character. All the specimens of cloth, etc., from Salt Cave were extremely brittle, and had only been preserved by saturating in gelatine and afterwards mounting between glass, while those from the grave in Short Cave were, from some cause, still in their natural pliable condition. In this connection it is also interesting to record the fact that the wooden bowl from the Mammoth Cave, in the collection of the American Antiquarian Society at Worcester, is the one which tradition gives as having been found in the passage of the Mammoth Cave, still known, from this circumstance, as the wooden-bowl chamber, and it is probable that the fragment of the wooden vessel found in Salt Cave was part of a similar article.

Capt. WM. H. DALL, of the United States Coast Survey, alluded to the mode of burial of the Aleutian Islanders, and of the preparation of the bodies after death, by which they were partially mummified. He also spoke of the beautiful braided grass-work of the Aleuts, and stated that the Eskimos made a kind of a stocking of braided grass, which they wore inside of their boots as an extra protection to the feet.

LISTS OF BIRDS OBSERVED AT VARIOUS LOCALITIES CONTIGUOUS
TO THE CENTRAL PACIFIC RAILROAD, FROM SACRAMENTO
CITY, CALIFORNIA, TO SALT LAKE CITY, UTAH.

BY ROBERT RIDGWAY.

Continued from page 174, Vol. vi.

The following species were found breeding on the adjacent mountains eastward of the Sierra Nevada, in July and August, 1867, and April and May, 1868:—

1. *Sialia arctica*. Abundant.
2. *Lophophanes inornatus*. Common (locally).
3. *Psaltiriparus minimus plumbeus*. Abundant (locally).
4. *Salpinctes obsoletus*. Very abundant.
5. *Catherpes Mexicanus conspersus*. Rare.
6. *Myiadestes Townsendi*. Common?
7. *Pipilo erythrophthalmus Oregonus*. Abundant.
8. *P. chlorurus*. Common.
9. *Scolecophagus cyanocephalus*. Very abundant.
10. *Corvus corax carolinensis*. Abundant.
11. *Gymnokitta cyanocephala*. Abundant.
12. *Empidonax obscurus*. Common.
13. *Selasphorus rufus*. Abundant.
14. *Trochilus Alexandri*. Abundant.
15. *Archibuteo lagopus Sanctijohannis*. Common.
16. *Aquila chrysaetus Canadensis*. Common.
17. *Falco saker polyagrus*. Common.
18. *F. columbarius*. Rare?
19. *Nisus Cooperi*. Rare.
20. *Oreortyx pictus plumifera*. Rare.

III. WESTERN NEVADA, ETC.

a. Eagle Valley (November 29, 1867).

In Eagle Valley but one locality was visited, viz., the town of Genoa and vicinity, including marshes in the valley and pine forests on the Sierra Nevada. In the former the usual species of water fowl were found, and also *Circus hudsonius* and *Falco polyagrus*. In the pines the species were the same as those near Carson City, but the mountain quail (*Oreortyx pictus plumifera*) was more common.

b. Carson Valley (Nov. 27-29, 1867; Jan 13-April 29, 1868).

The species breeding in the vicinity of Carson City were divided into three groups—one inhabiting the pine woods of the Sierra Nevada (Washoe Spur), one the cedar and piñon groves of the ranges

to the eastward, and the other the sage brush wastes and other localities in the valleys. The first two sets are included in lists under the head of *n, d*; the other was composed of the following species, inhabiting chiefly the sage brush and meadows:—

(*Sage-brush plains.*)

1. *Oreoscoptes montanus*. Very abundant.
2. *Eremophila alpestris chrysolæma*. Common.
3. *Collurio Ludovicianus excubitoroides*. Common.
4. *Poospiza Belli Nevadensis*. Very abundant.
5. *P. bilineata*. Rare.
6. *Spizella Breweri*. Abundant.
7. *Chondestes grammaca*. Common.
8. *Anrostomus Nuttalli*. Common.
9. *Chordelles popetue Henryi*. Common.
10. *Speotyto cunicularia hypogæa*. Rare.
11. *Zenaidura Carolinensis*. Very abundant.
12. *Centrocercus urophasianus*. Rare.

(*River valley.*)

1. *Geothlypis trichas*. Common.
2. *Icteria virens longicauda*. Common.
3. *Pyrranga Ludovicianæ*. Common.
4. *Vireo gilvus Swainsoni*. Abundant.
5. *Poocetes gramineus confinis*. Rare.
6. *Passerculus savanna alaudinus*. Common.
7. *Coturniculus passerinus perpallidus*. Common.
8. *Hedymeles melanocephalus*. Common.
9. *Cyanospiza amœna*. Common.
10. *Carpodacus frontalis*. Common.
11. *Melospiza melodia Heermanni*. Common.
12. *Pipilo erythrophthalmus Oregonus*. Common.
13. *Agelaius phœniceus*. Abundant.
14. *Xanthocephalus icterocephalus*. Abundant.
15. *Sturnella neglecta*. Abundant.
16. *Icterus Bullocki*. Abundant.
17. *Pica melanoleuca Hudsonica*. Very abundant.
18. *Tyrannus verticalis*. Very abundant.
19. *Contopus Richardsoni*. Abundant.
20. *Empidonax pusillus*. Abundant.
21. *Otus vulgaris Wilsonianus*. Common.
22. *Bubo Virginianus arcticus*. Rare.
23. *Falco sparverius*. Very abundant.
24. *Ægialitis vociferus*. Abundant.

25. *Tringoides macularius*. Abundant.
26. *Herodias alba egretta*. Rare.
27. *Nyctiardea grisea naevia*. Rare.
28. *Botaurus minor*. Common.
29. *Grus Canadensis*. Common.
30. *Porzana Carolina*. Common.
31. *Fulica Americana*. Common.
32. *Anas boschas*. Common.
33. *Querquedula cyanoptera*. Common.

(In suitable localities.)

1. *Progne subis*. Common.
2. *Tachycineta bicolor*. Abundant.
3. *Cotyle riparia*. Common.
4. *Steigldopteryx serripennis*. Abundant.
5. *Hirundo horreorum*. Common.
6. *Petrochelidon lunifrons*. Very abundant.
7. *Sayornis Sayus*. Common.
8. *Ceryle alcyon*. Common.

Farther down the river, where the cottonwood trees increase in number, the fauna was augmented by *Nephacetes niger* (extremely abundant), *Buteo Swainsoni* and *B. borealis calurus*, thus becoming essentially like that of the lower Truckee Valley (see table f.).

CATALOGUE OF WINTER RESIDENTS IN THE VICINITY OF CARSON CITY.

No.	Species.	Numbers.	Localities frequented.
1	<i>Turdus migratorius</i> . .	Common	Willows.
2	<i>Cinclus Mexicanus</i> . .	Rare	Streams.
3	<i>Sialia Mexicana</i>	Abundant	Fields and pines.
4	<i>S. arctica</i>	Abundant	Cedars and open fields.
5	<i>Regulus calendula</i> . . .	Abundant	Willows.
6	<i>Lophophanes inornatus</i> .	Abundant	Pines and cedars.
7	<i>Parus montanus</i>	Abundant	Pines only.
8	<i>Psaltiriparus minutus</i> <i>plumbeus</i>	Sometimes met with	Brushy ravines.
9	<i>Sitta Carolinensis aculeata</i>	Abundant	Pines only.
10	<i>S. pygmaea</i>	Abundant	Pines only.
11	<i>Certhia Americana</i> . . .	Not common . . .	All wooded places.
12	<i>Catherpes Mexicanus</i> <i>conspersus</i>	Common	Secluded rocky places.
13	<i>Telmatodytes palustris</i> <i>paludicola</i>	Common	Tules and rushes.
14	<i>Troglodytes aedon</i> <i>Parkmanni</i>	Not common . . .	Brushwood and willows.
15	<i>T. hyemalis Pacificus</i> . .	Rare	River bottoms.
16	<i>Anthus Ludovicianus</i> . .	Extremely abundant.	All wet open portions.
17	<i>Dendroica Auduboni</i> . . .	Common	Willows and cotton woods.
18	<i>Collurio borealis</i>	Not common . . .	Open situations.

No.	Species.	Numbers.	Localities frequented.
19	<i>C. Ludovicianus</i>	Abundant	Open situations.
20	<i>excubitoroides</i>	Rare	Mixed with flocks of <i>Eremophila</i> .
21	<i>PlectrophanesLapponicus</i>		
22	<i>Zonotrichia leucophrys</i>	Abundant	Willows and brushwood.
23	<i>intermedia</i>	Abundant	All wooded places.
24	<i>Junco hyemalis Oregonus</i>	Abundant	Sage-brush only.
25	<i>Poospiza Belli Nevadensis</i>	Common	Sage-brush and brush-wood.
26	<i>Spizella monticola</i>		
27	<i>Melospiza melodia</i>	Abundant	Willows and tules.
28	<i>Heermanni</i>	Rare	Willows along streams.
29	<i>Passerella schistacea</i>		
30	<i>Pipilo erythrophthalmus</i>	Abundant	All bushy places.
31	<i>Oregonus</i>		
32	<i>Eremophila alpestris</i>	Exceedingly abund't.	All open portions.
33	<i>chrysolema</i>	Abundant	Vicinity of corrals.
34	<i>Agelaius phoeniceus</i>		
35	<i>Xanthocephalus</i>	Not common . . .	Vicinity of corrals.
36	<i>icterocephalus</i>	Abundant	Sage-brush and fields.
37	<i>Sturnella neglecta</i>		
38	<i>Scolecophagus</i>	Extremely abundant	Vicinity of corrals.
39	<i>cianocephalus</i>		
40	<i>Pica melanoleuca</i>	Abundant	Everywhere, particularly around slaughter-houses.
41	<i>Hudsonica</i>		
42	<i>Cyanura Stelleri frontalis</i>	Abundant	Pines and brushy ravines.
43	<i>Gymnokitta cyanocephala</i>	Abundant	Piñon and cedars only.
44	<i>Picicorvus Columbianus</i>	Abundant	Pines only.
45	<i>Corvus corax carlinvorus</i>	Abundant	About slaughter-houses.
46	<i>Picus villosus Harrisii</i>	Common	All wooded places.
47	<i>P. albolarvatus</i>	Rather common . .	Pines only.
48	<i>Picoides arcticus</i>	Rare	Pines only.
49	<i>Sphyrapicus thyroideus</i>	Common	Pines only.
50	<i>Colaptes auratus</i>		
51	<i>Mexicanus</i>	Abundant	Everywhere.
52	<i>Speotyto cunicularia</i>		
53	<i>hypogæa</i>	Rare	Sage-brush and fields.
54	<i>Bubo Virginianus arcticus</i>	Rare	Woods.
55	<i>Otus vulgaris Wilsonianus</i>	Common	Willows.
56	<i>Falco saker polyagrus</i>	Common	Open situations.
57	<i>F. columbarius</i>	Rare	Open situations.
58	<i>F. sparverius</i>	Very abundant . .	Woods chiefly.
59	<i>Circus cyaneus Hudsonius</i>	Common	Marshes and streams.
60	<i>Nisus Cooperi</i>	Rare	General.
61	<i>Aquila chrysaetos</i>		
62	<i>Canadensis</i>	Common	Mountains.
63	<i>Archibuteo lagopus</i>		
64	<i>Sanctijohannis</i>	Common	General.
65	<i>Buteo borealis calurus</i>	Common	Woods chiefly.
66	<i>B. Swainsoni</i>	Common	River valley.
67	<i>Oreortyx pictus plumifera</i>	Rare	Mountains.
68	<i>Agialitis vociferus</i>	Rare	Streams.
69	<i>Botaurus minor</i>	Rare	Marshes and streams.
70	<i>Branta Canadensis</i>	Abundant	Lakes, etc.
71	<i>Hutchinsi</i>	Abundant	Lakes, etc.
72	<i>Anas boschas</i>	Abundant	Lakes, etc.
73	<i>Aythya Americana</i>	Abundant	Lakes, etc.
74	<i>A. vallisneria</i>	Abundant	Lakes, etc.
75	<i>Bucephala Americana</i>	Abundant	Lakes, etc.
76	<i>B. albeola</i>	Abundant	Lakes, etc.
77	<i>Fulix marila</i>	Abundant	Lakes, etc.
78	<i>F. collaris</i>	Abundant	Lakes, etc.
79	<i>Eriematura rubida</i>	Abundant	Lakes, etc.
80	<i>Podiceps occidentalis</i>	Common	Lakes, etc.
81	<i>P. auritus Californicus</i>	Common	Lakes, etc.
82	<i>Podilymbus podiceps</i>	Common	Lakes, etc.

d. Washoe Valley (May 9, 1868).

In passing by the shore of Washoe Lake, large numbers of the following species were seen:—*Fulica Americana*, *Sterna regia*, *S. Forsteri* and *Hydrochelidon fissipes*. Among the open pine groves and scattered pine trees which reached from the slope of the lofty and heavily timbered Washoe Mountains out some distance upon the valley, the characteristic birds were *Cyanura Stelleri frontalis*, *Melanerpes torquatus*, *Sialia Mexicana* and *Turdus migratorius*; penetrating a short distance into the forest, *Picus albolarvatus* and *Passerella iliaca megarhynchus* were found to be common.

e. Truckee Meadows (July 16–20; November 5–7 and 11–20, 1867).

The characteristic birds of the summer fauna were chiefly numerous water-fowl, especially *Querquedula cyanoptera*, *Chaulelasmus streperus*, *Anas boschas*, *Fulica Americana*, *Recurvirostra Americana*, and *Himantopus nigricollis*, all found in the greatest abundance. In the fall the following species not met with in the summer, were observed:—*Anthus Ludovicianus* (excessively abundant), *Corvus Americanus* (common), *Archibuteo lagopus Sanctijohannis* (abundant). A yellow-winged *Colaptes*, probably *C. chrysoides*, was seen.

f. Catalogue of the Birds breeding in the Truckee Valley (May and June, 1868 and July and August, 1867.)

1. *Oreoscoptes montanus*. Common.
2. *Troglodytes ædon* Parkmanni. Abundant.
3. *Telmatodytes palustris paludicola*. Abundant.
4. *Dendroica æstiva*. Abundant.
5. *Geothlypis trichas*. Common.
6. *Icteria virens longicauda*. Common.
7. *Pyranga Ludoviciana*. Common.
8. *Hirundo horreorum*. Common.
9. *Tachycineta bicolor*. Very abundant.
10. *Progne subis*. Rare.
11. *Stelgidopteryx serripennis*. Abundant.
12. *Cotyle riparia*. Abundant.
13. *Petrochelidon lunifrons*. Abundant.
14. *Vireo gilvus Swainsoni*. Abundant.
15. *Collurio Ludovicianus excubitoroides*. Common.
16. *Carpodacus frontalis*. Common.
17. *Chrysomitris tristis*. Rare.
18. *Passerculus savanna alaudinus*. Common.
19. *Poocetes gramineus confinis*. Rare.

20. *Melospiza melodia* Heermanni. Abundant.
21. *Poospiza bilineata*. Common.
22. *P. Belli* Nevadensis. Abundant.
23. *Spizella socialis* Arizonae. Abundant.
24. *S. Breweri*. Abundant.
25. *Chondestes grammacus*. Abundant.
26. *Hedymeles melanocephalus*. Common.
27. *Cyanospiza amœna*. Rare.
28. *Pipilo erythrophthalmus* Oregonus. Common.
29. *P. chlorura*. Rare.
30. *Molothrus pecoris*. Rare.
31. *Agelaius phœniceus*. Abundant.
32. *Xanthocephalus icterocephalus*. Abundant.
33. *Sturnella neglecta*. Abundant.
34. *Icterus Bullocki*. Abundant.
35. *Pica melanoleuca* Hudsonica. Abundant.
36. *Tyrannus Carolinensis*. Common.
37. *T. verticalis*. Abundant.
38. *Myiarchus crinitus cinerascens*. Rare.
39. *Sayornis Sayus*. Rare.
40. *Contopus Richardsoni*. Abundant.
41. *Empidonax pusillus*. Abundant.
42. *Chordeiles popetue* Henryi. Common.
43. *Nephœetes niger borealis*. Rare.
44. *Chætura Vauxi*. Common.
45. *Trochilus Alexandri*. Abundant.
46. *Ceryle alcyon*. Common.
47. *Coccyzus Americanus*. Rare.
48. *Picus villosus* Harrisii. Common.
49. *Colaptes auratus* Mexicanus. Abundant.
50. *Bubo Virginianus arcticus*. Common.
51. *Otus vulgaris* Wilsonianus. Common.
52. *Circus cyaneus* Hudsonius. Abundant.
53. *Falco sparverius*. Very abundant.
54. *Buteo borealis* calurus. Common.
55. *B. Swainsoni*. Common.
56. *Pandion hallæus* Carolinensis. Rare.
57. *Rhinogryphus aura*. Abundant.
58. *Zenaidura Carolinensis*. Very abundant.
59. *Ægialitis vociferus*. Common.
60. *Recurvirostra Americana*. Common.
61. *Himantopus nigricollis*. Common.
62. *Rhyacophilus glareola solitarius*. Rare.
63. *Tringoides macularius*. Common.

64. *Numenius longirostris*. Rare.
65. *Herodias alba egretta*. Rare.
66. *Nyctiardea grisea nævia*. Rare.
67. *Botaurus minor*. Common.
68. *Ardetta exilis*. Rare.
69. *Grus Canadensis*. Common.
70. *Rallus Virginianus*. Common.
71. *Porzana Carolina*. Common.
72. *Fulica Americana*. Abundant.
73. *Branta Canadensis*. Common.
74. *Anas boschas*. Very abundant.
75. *Dafla acuta*. Common?
76. *Chaulelasmus streperus*. Very abundant.
77. *Mareca Americana*. Common.
78. *Querquedula cyanoptera*. Abundant.
79. *Q. discors*. Rare?
80. *Spatula clypeata*. Common?
81. *Aix sponsa*. Rare?
82. *Erismatura rubida*.
83. *Graculus dilophus*.
84. *Sterna regia*.
85. *S. Forsteri*.
86. *Podiceps occidentalis*.
87. *P. auritus Californicus*.
88. *Podilymbus podiceps*.

g. Species breeding on adjacent plateaux.

1. *Eremophila alpestris chrysolaema*. Common.
2. *Antrostomus Nuttalli*. Common.
3. *Speotyto cunicularia hypogaea*. Rare.
4. *Centrocercus urophasianus*. Common.

h. Species breeding on the rocky islands in Pyramid Lake.

1. *Tachycineta thalassina*. Abundant.
2. *Falco communis anatum*. One pair.
3. *Haliaeetus leucocephalus*. One pair.
4. *Ardea herodias*. Abundant.
5. *Pelecanus erythrorhynchus*. Excessively abundant.
6. *Larus Californicus*. Excessively abundant.

The following notes relate further to the bird-fauna of Western Nevada:

**List of species observed in the Lower Truckee Valley in
May and not at other times.**

1. *Nephocetes niger borealis*. Rare.
2. *Chaetura Vauxi*. Common.
3. *Trochilus Alexandri*. Common.
4. *Turdus Swainsoni ustulatus*. Rare.
5. *Carpodacus frontalis*. Abundant.
6. *Molothrus pecoris*. Rare.

Species seen only in July and August.

1. *Selasphorus rufus*. Very abundant.
2. *Tyrannus Carolinensis*. Several pairs.
3. *Myiodiocytes pusillus*. Rare.

Species seen only in December.

1. *Regulus calendula*. Very abundant.
2. *Anthus Ludovicianus*. Very abundant.
3. *Dendroica Auduboni*. Very abundant.
4. *Sialia arctica*. Rare.
5. *Troglodytes parvulus hyemalis*. Rare.
6. *Certhia familiaris fusca*. Rare.
7. *Zonotrichia leucophrys intermedia*. Very abundant.
8. *Junco hyemalis Oregonus*. Very abundant.
9. *Spizella monticola*. Common.

SPRING ARRIVAL OF BIRDS IN WESTERN NEVADA IN 1868.

a. Carson City.

1. <i>Sayornis Sayus</i>	March 12.
2. <i>Salpinctes obsoletus</i>	" 20.
3. <i>Oreoscoptes montanus</i>	" 24.
4. <i>Tachycineta bicolor</i>	" 25.
5. <i>Poocætes gramineus confinis</i>	April 1.
6. <i>Rhinogryphus aura</i>	" 2.
7. <i>Hirundo horreorum</i>	" 8.
8. <i>Spizella Breweri</i>	" 9.
9. <i>Stelgidopteryx serripennis</i>	" 15.
10. <i>Empidonax obscurus</i>	" 21.
11. <i>Tyrannus verticalis</i>	" 22.
12. <i>Progne subis</i>	" 23.
13. <i>Zenaidura Carolinensis</i>	" 23.
14. <i>Pipilo chlorurus</i>	" 25.

15. <i>Melanerpes torquatus</i>	April	25.
16. <i>Spizella socialis Arizonae</i>	"	29.
17. <i>Cyanocitta Floridae Californica</i>	"	29.
18. <i>Melospiza Lincolni</i>	"	29.
19. <i>Tringoides macularius</i>	"	29.
20. <i>Vireosylvia gilva Swainsoni</i>	"	29.
21. <i>Chondestes grammacus</i>	May	3.
22. <i>Myiadestes Townsendii</i>	"	4.
23. <i>Petrochelidon lunifrons</i>	"	4.

b. Washoe Valley.

24. <i>Fulica Americana</i>	May	9.
25. <i>Sterna regia</i>	"	9.
26. <i>Hydrochelidon fissipes</i>	"	9.

(These were all abundant at this date.)

c. Steamboat Valley.

27. <i>Dendroica aestiva</i>	May	9.
28. <i>Cyanospiza amoenae</i>	"	9.
29. <i>Icterus Bullocki</i>	"	9.

d. Truckee Meadows.

30. <i>Geothlypis trichas</i>	May	10.
31. <i>Icteria virens longicauda</i>	"	10.
32. <i>Pyranga Ludoviciana</i>	"	10.

e. Truckee Reservation, near Pyramid Lake.

33. <i>Carpodacus frontalis</i>	May	13.
34. <i>Poospiza bilineata</i>	"	13.
35. <i>Rhyacophilus glareola solitarius</i>	"	13.
36. <i>Hedymeles melanocephalus</i>	"	14.

IV. EASTERN NEVADA, ETC.

a. Birds found in the West Humboldt Mountains,

Sept. 3-Oct. 23, 1867.

1. *Turdus migratorius*. Common.
2. *Sialia arctica*. Common.
3. *Cinclus Mexicanus*. Common.

4. *Psaltiriparus minimus plumbeus*. Abundant.
5. *Salpinctes obsoletus*. Common.
6. *Troglodytes ædon Parkmanni*. Common.
7. *Anthus Ludovicianus*. Common.
8. *Eremophila alpestris chrysolaema*. Common.
9. *Helminthophaga celata*. Common.
10. *H. celata lutescens*. Rare.
11. *Dendroica æstiva*. Common.
12. *D. Auduboni*. Common.
13. *Geothlypis Macgillivrayi*. Common.
14. *Icteria virens longicauda*. Common.
15. *Myiodytes pusillus*. Abundant.
16. *Vireosylvia gilva Swainsoni*. Abundant.
17. *Lanivireo solitaria Cassini*. Rare.
18. *L. solitarius*. Very rare.
19. *Collurio Ludovicianus excubitoroides*. Rather common.
20. *Carpodacus frontalis*. Rare.
21. *Passerculus savanna alaudinus*. Common.
22. *Melospiza melodia fallax*. Common.
23. *M. melodia guttata*. One specimen.
24. *Zonotrichia leucophrys intermedia*. Abundant.
25. *Z. coronata*. One specimen.
26. *Poospiza Belli Nevadensis*. Rare.
27. *P. bilineata*. Rare.
28. *Junco hyemalis Oregonus*. Common.
29. *Hedymeles melanocephalus*. Common.
30. *Pipilo erythrophthalmus Oregonus*. Common.
31. *P. chlorura*. Common.
32. *Agelaius phœnicens*. Common.
33. *Sturnella neglecta*. Common.
34. *Icterus Bullocki*. Rare.
35. *Scolecophagus cyanocephalus*. Very abundant.
36. *Corvus corax carinivorus*. Common.
37. *Pica melano-leuca Hudsonica*. Abundant.
38. *Cyanocitta Floridana Woodhousei*. Common.
39. *Sayornis Sayus*. Common.
40. *Empidonax obscurus*. Rare.
41. *Colaptes auratus Mexicanus*. Common.
42. *C. chrysoides*? One specimen.
43. *Nisus Cooperi*. Rare.
44. *Ectopistes migratoria*. One specimen.
45. *Zenaidura Carolinensis*. Abundant.
46. *Centrocercus urophasianus*. Common.
47. *Regulus calendula*. Common.

b. Species breeding on Toyabe Mountains, at an altitude of about 6,500-7,000 feet (Austin, July 2-4, 1868).

1. *Oreoscoptes montanus*. Rare.
2. *Turdus migratorius*. Common.
3. *Pipilo chlorurus*. Very abundant.
4. *Empidonax obscurus*. Abundant.
5. *Eremophila alpestris* (*leucolæma*?) Common.
6. *Spizella Breweri*. Abundant.
7. *Cyanospiza amœna*. Common.
8. *Poocætes gramineus confinis*. Common.
9. *Panyptila saxatilis*. Rare.

c. Eastern slope of Ruby Mountains (July 13-Sept. 1).

1. *Turdus migratorius*. Common.
2. *Oreoscoptes montanus*. Rare.
3. *Sialia arctica*. Abundant.
4. *Parus montanus*. Rare.
5. *Psaltiriparus minimus plumbeus*. Rare.
6. *Salpinctes obsoletus*. Common.
7. *Catherpes Mexicanus conspersus*. Rare.
8. *Troglodytes ædon Parkmanni*. Common.
9. *Eremophila alpestris* (*chrysolæma*?) Common.
10. *Helminthophaga Virginiae*. Common.
11. *Dendroica æstiva*. Abundant.
12. *D. nigrescens*. Common.
13. *Geothlypis Macgillivrayi*. Common.
14. *Icteria virens longicauda*. Rare.
15. *Myiodiocetes pusillus*. Rare.
16. *Pyranga Ludoviciana*. Common.
17. *Tachycineta thalassina*. Abundant.
18. *Hirundo horreorum*. Common.
19. *Petrochelidon lunifrons*. Very abundant.
20. *Vireo solitarius plumbeus*. Common.
21. *Vireosylvia gilva Swainsoni*. Abundant.
22. *Collurio Ludoviciana excubitoroides*. Common.
23. *Carpodacus Cassini*. Very abundant.
24. *Loxia leucoptera*. One specimen.
25. *Chrysomitris pinus*. Very abundant.
26. *C. tristis*. Rare.
27. *Poocætes gramineus confinis*. Common.
28. *Melospiza melodia fallax*. Common.

¹ What was taken to be *P. melanotis*, a North Mexican species, was seen here.

29. *Poospiza Belli Nevadensis*. Common.
30. *Spizella Breweri*. Common.
31. *S. socialis Arizonae*. Very abundant.
32. *Chondestes grammacus*. Common.
33. *Hedymeles melanocephalus*. Common.
34. *Cyanospiza amcena*. Common.
35. *Pipilo erythrophthalmus megalonyx*. Rare.
36. *P. chlorura*. Rare.
37. *Icterus Bullocki*. Common.
38. *Scolecophagus cyanocephalus*. Rare.
39. *Corvus corax carinivorus*. Common.
40. *Picicorvus Columbianus*. Common.
41. *Gymnokitta cyanocephala*. Common.
42. *Cyanocitta Floridana Woodhousei*. Common.
43. *Tyrannus verticalis*. Abundant.
44. *Myiarchus crinitus cinerascens*. Common.
45. *Sayornis Sayus*. Common.
46. *Contopus borealis*. Rare.
47. *C. Richardsoni*. Abundant.
48. *Empidonax obscurus*. Abundant.
49. *E. pusillus*. Abundant.
50. *Antrostomus Nuttalli*. Common.
51. *Chordeiles popetue Henryi*. Abundant.
52. *Panyptila saxatilis*. Excessively abundant.
53. *Stellula calliope*. Common.
54. *Selasphorus platycercus*. Excessively abundant.
55. *Trochilus Alexandri*. Common.
56. *Picus villosus Harrisii*. Rare.
57. *Colaptes auratus Mexicanus*. Common.
58. *Falco saker polyagrus*. Common.
59. *F. sparverius*. Abundant.
60. *Aquila chrysaetus Canadensis*. Common.
61. *Buteo borealis calurus*. Common.
62. *B. Swainsoni*. Common.
63. *Nisus Cooperi*. Rare.
64. *Zenaidura Carolinensis*. Abundant.
65. *Centrocercus urophasianus*. Common.

d. Species found on the eastern slope of the East Humboldt
Mountains (September 4-10, 1868.)

1. *Troglodytes aëdon Parkmanni*. Common.
2. *Helminthophaga ruficapilla*.³ One specimen.

³ The species in *italic* were met with no farther west than this locality.

3. *H. celata*. Very abundant.
4. *H. celata lutescens*.² Very rare.
5. *Dendroica Townsendi*. Rare.
6. *D. occidentalis*. Rare.
7. *Geothlypis trichas*. Common.
8. *G. Macgillivrayi*. Common.
9. *Turdus Swainsoni*. Common.
10. *Chrysomitris pinus*. Abundant.
11. *Pooecetes gramineus confinis*. Abundant.
12. *Contopus Richardsoni*. Common.
13. *Empidonax obscurus*. Abundant.
14. *E. Hammondi*. Common.
15. *Scelaphorus rufus*.² One pair.
16. *S. platycercus*. Abundant.
17. *Melanerpes torquatus*. Common.
18. *Canace obscura*. Common.

c. Species observed in the Upper Humboldt Valley
(September 10-19).

1. *Turdus Pallasi nanus*. One specimen.
2. *T. Swainsoni*. Common.
3. *Helminthophaga celata*. Common.
4. *Sitta Canadensis*. Rare.
5. *Ampelis cedrorum*. Rare.
6. *Vireo solitarius*. Rare.
7. *Passerculus savanna alaudinus*. Common.
8. *Zonotrichia leucophrys intermedia*. Abundant.
9. *Melospiza melodia fallax*. Abundant.
10. *M. Lincolnii*. Common.
11. *Passerella iliaca schistacea*. Common.
12. *Junco hyemalis Oregonus*. Abundant.
13. *Pipilo chlorura*. Common.
14. *Empidonax obscurus*. Common.
15. *Anthus Nuttalli*. Common.
16. *Picus villosus Harrisii*. Common.
17. *P. pubescens Gairdneri*. Rare.
18. *Sphyrapicus varius nuchalis*. Rare.
19. *Melanerpes torquatus*. Rare.
20. *Nisus fuscus*. Common.
21. *Pediocetes phasianellus Columbianus*. Abundant.

* These species were seen no farther east than this locality.

f. Species found in the Lower Humboldt Valley (at the "Sink,"

August 20-27, 1867).

1. *Passerculus savanna alaudinus*. Abundant.
2. *Eremophila alpestris chrysolæma*. Abundant.
3. *Corvus corax carinivorus*. Abundant.
4. *Recurvirostra Americana*. Abundant.
5. *Himantopus nigricollis*. Abundant.
6. *Actodromus minutilla*. Abundant.
7. *A. Bairdi*. Abundant.
8. *Ereunetes pusillus*. Abundant.
9. *Ibis thalassinus*. Abundant.
10. *Sterna regia*. Abundant.
11. *S. Forsteri*. Abundant.

At the town of Oreana, about a day's journey above, *Ibis thalassinus* was found, and also several species of land birds, in addition to the above, as *Oreoscoptes montanus*, *Poospiza Belli Nevadensis*, *Melospiza melodia fullax*, *Xanthocephalus icterocephalus*, *Agelaius phoeniceus*, *Sturnella neglecta*, etc.

g. List of species found at Soda Lake, Carson Desert

(June 28, 1868).

1. *Phænopepla nitens*? One specimen.
2. *Himantopus nigricollis*. Abundant.
3. *Recurvirostra Americana*. Abundant.

h. Species found at Ruby and Franklin Lakes, Ruby Valley

(July 13-September 4, 1868.)

1. *Geothlypis trichas*. Common.
2. *Telmatodytes palustris paludicola*. Common.
3. *Coturniculus passerinus perpallidus*. Common.
4. *Passerculus savanna alaudinus*. Abundant.
5. *Agelaius phoeniceus*. Abundant.
6. *Xanthocephalus icterocephalus*. Abundant.
7. *Dolichonyx oryzivorus*. Abundant.
8. *Ibis guarauna*? Abundant.
9. *Ardea herodias*. Abundant.
10. *Fulica Americana*. Abundant.
11. *Branta Canadensis*. Abundant.
12. *Anas boschas*. Abundant.
13. *Sterna Forsteri*. Abundant.
14. *Hydrochelidon flssipes*. Abundant.

g. Species seen in Thousand Spring Valley (Sept. 20-25).

1. *Dendroica Townsendi*.
2. *Zonotrichia leucophrys intermedia*.
3. *Empidonax obscurus*.
4. *Picus villosus Harrisii*.
5. *Sphyrapicus varius nuchalis*.
6. *Nyctale acadica*.

**j. Species observed at "City of Rocks," southern Idaho
(October 8, 1868).**

1. *Corvus corax carlinivorus*. Common.
2. *Gymnokitta cyanocephala*. Abundant.
3. *Cyanocitta floridana woodhousei*. Abundant.
4. *Centrocercus urophasianus*. Common.
5. *Rhinogryphus aura*. Common.

k. Species found at Deep Creek, Northwestern Utah (Oct. 5, 1868.)

1. *Telmatochlamys palustris paludicola*. Abundant.
2. *Geothlypis trichas*. Common.
3. *Zonotrichia leucophrys intermedia*. Abundant.
4. *Melospiza melodia fallax*. Abundant.
5. *M. Lincolnii*. Common.

V. EASTERN UTAH.⁴

**a. Species breeding in the Salt Lake Valley (May 20-June 2, and
June 16-21, 1869).**

1. *Turdus migratorius*.† Rare?
2. *Oreoscoptes montanus*. Common.
3. *Galeoscoptes Carolinensis*. Common.
4. *Sialia arctica*.† Common.
5. *Troglodytes aëdon parkmanni*. Common.
6. *Telmatochlamys palustris paludicola*. Very abundant.
7. *Eremophila alpestris chrysolaema*. Common.
8. *Dendroica aestiva*. Abundant.
9. *Geothlypis trichas*. Common.
10. *Icteria virens longicauda*. Common.
11. *Setophaga ruticilla*. Common.

⁴ See Bulletin of the Essex Institute, V, Nov., 1873, pp. 168-173, for paper entitled "Notes on the Bird Fauna of the Salt Lake Valley and adjacent portions of the Wahsatch Mountains."

† Species so marked have been attracted from the adjoining mountains by the protection and accommodations provided by man.

[To be continued.]

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 7. SALEM, MASS., FEBRUARY, 1875. No. 2.

One Dollar a Year in Advance. 10 Cents a Single Copy.

REGULAR MEETING, MONDAY, JANUARY 18, 1875.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence :—

From E. J. Attinelli, New York, Jan. 5; F. H. Appleton, Boston, Jan. 7; W. S. Barton, Worcester, Jan. 14; Hayden Brown, West Newbury, Jan. 9; G. W. W. Dove, Andover, Jan. 9; D. A. Gleason, Boston, Jan. 16; Julia Ward Howe, Boston, Jan. 19; Jacob Leamon, Croton, Ohio, Dec. 29.

The LIBRARIAN reported the following additions to the library :—

By Donation.

COLE, Mrs. N. D. Salem Gazette for 1874.
GREEN, S. A., of Boston. Miscellaneous pamphlets, 21.
HUNT, T. F. Spirit of the Fair. 1 vol. 4to. 1864. Our Daily Fare. 1 vol. 4to. 1864. Hamilton's Genealogical Tables of the Hindus. 1 vol. folio.
PERKINS, SAM'L C., of Phila. Proceedings at the Laying of the Corner Stone of the New Public Buildings in Penn. Square, in Phila., July 4, 1874. 8vo pamph.
U. S. PATENT OFFICE. Official Gazette, Dec. 15, 22, 29.
WATERS, J. LINTON. The External Aspects of the Sun, by Prof. S. P. Langley.

By Exchange.

HARVARD COLLEGE. Forty-ninth Annual Report of the President. 1873-74.
HISTORICAL AND PHILOSOPHICAL SOCIETY OF OHIO. Annual Report. 1874.
ESSEX INST. BULLETIN. VII 3

NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Genealogical and Biographical Record. Jan., 1875. 8vo pamph.

NEW YORK LYCEUM OF NATURAL HISTORY. Annals, Vol. xi, Nos. 1-2, July, 1874.

ROYAL CORNWALL POLYTECHNIC SOCIETY. Forty-First Annual Report, 1873. 1 vol. 12mo.

PUBLISHERS. American Journal of Science and Art. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Public Spirit. Quaritch's Catalogue. Salem Observer. Salem Post.

The meeting was principally occupied in listening to a very interesting and instructive presentation of the subject of comb manufacturing, by Hayden Brown, Esq., of West Newbury, who has been engaged for many years in the business. He gave a detailed account of the process of the manufacture of horn combs, interspersed with many entertaining anecdotes and pithy sayings. The first combs made in America were manufactured by hand, and with rude implements, in 1759, by Enoch Noyes, of Newbury, a self-taught mechanic, who cut horn buttons and coarse combs as well as he was able. He continued at this business until 1778; when William Cleland, a deserter from Burgoyne's army, a comb-maker by profession and a skilful workman, sought out Mr. Noyes and engaged with him, greatly increasing the production of combs, the manufacture of which has been continued in Newbury to this day, and immensely increased by the use of the most ingenious machines, one of which, he stated, tended by a lad of twelve years, can do the work which formerly required thirty-five men, and with his present force of fifty men, he could turn out more and better combs than a regiment of men could a half or three-quarters of a century ago.

Mr. Brown thought the earliest combs used must have been made of wood. Specimens were exhibited of the crude horn, of the material after it had gone through the several processes required, and of the several varieties of combs manufactured, beautifully finished and polished.

He referred to the immense number of cattle slaughtered every year, giving some interesting statistics to show where the horns required for such an immense manufacture came from, and stated some of his experiences abroad and at home in connection with the business. He was listened to with great attention, and the thanks of the Institute were voted to him for his entertaining and instructive address.

Mr. F. W. PUTNAM stated that combs made of various materials were in use among uncivilized nations, and mentioned the bronze combs of prehistoric times in Europe as similar to those now in use.

On motion of Mr. Putnam the thanks of the Institute were tendered to Mr. Brown for his remarks, and for his kindness in promoting the technological department of the Institute.

Arthur S. Gray, of Danvers, Jerome Horton Fiske and D. Henry Taylor of Salem, were duly elected resident members.

Adjourned.



REGULAR MEETING, MONDAY, FEBRUARY 1, 1875.

MEETING this evening at 7.30 o'clock. Vice President F. W. PUTNAM in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence :—

From J. W. Dean, Boston, Jan. 18, 21; F. H. Johnson, Andover, Jan. 18; J. F. Mayer, New York, Jan. 18; A. W. Morgan, New York, Jan. 28; A. T. Perkins, Boston, Jan. 21; Charles Phillips, Philadelphia, Jan. 20; R. Ridgway, Washington, D. C., Jan. 29.

Among the donations to the cabinets announced were the commission of a letter of marque, bearing the signatures of Madison and Munroe, presented by Rev. Mr. Atwood, and a unique Indian stone implement from Peabody, presented by Mr. John V. Stevens, for each of which thanks were voted to the donors.

Prof. A. GRAHAM BELL, now a resident in Salem, occupied the evening with a singularly interesting and curiously instructive address on the subject of speech, with illustrative experiments of various kinds, and the aid of Rev. E. C. Bolles with his camera. Prof. Bell has practically introduced into this country the system of Visible Speech invented by his father, Prof. A. M. Bell of University College, London. Mr. Bell, in conjunction with Dr. Clarence J. Blake, the aurist, of Boston, has conducted a series of experiments, the remarkable results of which were now first exhibited to a public audience.

Mr. Bell had succeeded in using the *membrana tympani* of the human ear as a phonautograph. An ear from a dead subject had been experimented upon. A small style of hay was attached to one of the ossiculæ, and a hearing tube was inserted in the outer ear. When any sound was uttered into the tube, the *membrana tympani* was set in vibration, and its motion was communicated to the style. This latter was then caused to record its vibration upon a plate of smoked glass passed rapidly underneath. Mr. Bell stated that each different vowel uttered into the tube caused the style to trace a different curve upon the glass. A large number of these tracings were exhibited to the audience by means of the camera.

Mr. Bell was provided with accurate representations and models of the vocal organs and organs of hearing so as clearly to point out their several parts, even to the

most delicate, and showed how sound was produced. He averred that each note was not a single tone, as it appears to be, but a composite of several, including the fundamental, or loudest, with the addition of overtones and undertones; there was no such thing as a tone pure and simple. He explained the pitch, the quality, timbre, and resonance of tones, and showed how they were produced. He showed that, as ripples are produced in the water, so wave ripples are produced in the air by different sounds, each sound causing a combination of wavelets, the curves of which can be made visible to the eye and many of which are of exceeding beauty. These were exhibited to the audience by means of a gas jet, whose vibrations were reflected in a mirror, through an ingeniously contrived apparatus, the manometric capsule invented by Scott and Koenig. He explained how the notes of different musical instruments operated in the vibrations of the air, and what caused the differences in the sounds. In short, he gave a most attractive and instructive exposition of the mysteries of speech as it affects the air, the vocal organs, and the ear, and was listened to with the most absorbed attention.

After some complimentary remarks from Mr. W. P. UPHAM and the presiding officer, the thanks of the audience were unanimously voted to Prof. Bell for his able and excellent lecture.

LISTS OF BIRDS OBSERVED AT VARIOUS LOCALITIES CONTIGUOUS
TO THE CENTRAL PACIFIC RAILROAD, FROM SACRAMENTO
CITY, CALIFORNIA, TO SALT LAKE CITY, UTAH.

BY ROBERT RIDGWAY.

[Continued from page 24.]

12. *Pyrranga ludoviciana*. Common.
13. *Progne subis*.† Common.
14. *Petrochelidon lunifrons*.† Abundant.
15. *Tachycineta bicolor*.† Common.
16. *Hirundo horreorum*.† Common.
17. *Cotyle riparia*. Common.
18. *Stelgidopteryx serripennis*. Abundant.
19. *Vireosylvia gilva swainsoni*. Abundant.
20. *Carpodacus frontalis*. Common.
21. *Chrysomitris tristis*. Common?
22. *Passerculus savanna alaudinus*. Common.
23. *Coturniculus passerinus perpallidus*. Common.
24. *Melospiza melodia fallax*. Common.
25. *Poospiza bilineata*. Common.
26. *Spizella breweri*. Abundant.
27. *S. socialis arizonæ*. Common.
28. *Chondestes grammacus*. Abundant.
29. *Hedymeles melanocephalus*. Common.
30. *Cyanospiza amoena*. Common.
31. *Pipilo erythrophthalmus megalonyx*. Abundant.
32. *Dolichonyx oryzivorus*. Common?
33. *Molothrus pecoris*. Common.
34. *Agelaius phoeniceus*. Very abundant.
35. *Xanthocephalus icterocephalus*. Very abundant.
36. *Sturnella neglecta*. Common.
37. *Icterus bullocki*. Common.
38. *Cyanocitta floridana woodhousei*. Rare?
39. *Tyrannus verticalis*. Abundant.
40. *T. carolinensis*. Common.
41. *Sayornis sayus*. Common.
42. *Contopus richardsoni*. Abundant.
43. *Empidonax pusillus*. Abundant.
44. *Anthus nuttalli*. Common.
45. *Chondestes popetue henryi*. Common.
46. *Selasphorus platycircus*.† Common.
47. *Trochilus alexandri*.† Common.
48. *Ceryle alcyon*. Common.

49. *Melanerpes erythrocephalus*. One specimen.
50. *Colaptes auratus Mexicanus*. Common.
51. *Speotyto cunicularia hypogæa*. Rare?
52. *Circus cyaneus Hudsonius*. Common.
53. *Falco saker polyagrus*. Common.
54. *F. sparverius*. Abundant.
55. *Buteo Swainsoni*. Abundant.
56. *Zenaidura Carolinensis*. Abundant.
57. *Centrocercus urophasianus*. Common?
58. *Pedlocætes phasianellus Columbianus*. Common?
59. *Ægialitis vociferus*. Common.
60. *Æ. cantianus nivosus*. Very abundant.
61. *Recurvirostra Americana*. Very abundant.
62. *Himantopus nigricollis*. Very abundant.
63. *Steganopus Wilsoni*. Common.
64. *Ereunetes pusillus*. Common.
65. *Actodromus minutilla*. Common.
66. *Tringoides hypoleucus macularius*. Common.
67. *Symphemla semipalmata*. Abundant.
68. *Numenius longirostris*. Abundant.
69. *Ibis guarauna*. Abundant.
70. *Ardea herodias*. Common.
71. *Herodias alba egretta*. Rare?
72. *Botaurus minor*. Common.
73. *Grus Canadensis*. Common.
74. *Rallus Virginianus*. Common.
75. *Porzana Carolina*. Common.
76. *Fulica Americana*. Abundant.
77. *Anas boschas*. Abundant.
78. *Dafila acuta*. Common?
79. *Chaulelasmus streperus*. Abundant.
80. *Mareca Americana*. Abundant.
81. *Spatula clypeata*. Abundant?
82. *Querquedula cyanoptera*. Abundant.
83. *Q. discors*? Rare?
84. *Nettion Carolinensis*. Rare?
85. *Erismatura rubida*. Common.
86. *Graculus dilophus*. Common.
87. *Sterna regia*. Common.
88. *S. Forsteri*. Abundant.
89. *Hydrochelidon fissipes*. Abundant.
90. *Podiceps occidentalis*. Abundant.
91. *P. auritus Californicus*. Abundant.
92. *Podilymbus podiceps*. Common.

b. Species breeding only on the islands in Great Salt
Lake (June, 1869).

1. *Branta Canadensis*. Common.
2. *Pelecanus erythrorhynchus*. Abundant.
3. *Larus Californicus*. Very abundant.

c. List of the species breeding in Parley's Park, Wahsatch Mountains,
Utah (June 23-July 2; July 16-Aug. 16, 1869).

1. *Turdus migratorius*. Common.
2. *T. Swainsoni*. Abundant.
3. *T. Pallasi Auduboni*. Common.
4. *Galeoscoptes Carolinensis*. Common.
5. *Sialia arctica*. Common.
6. *Cinclus Mexicanus*. Common.
7. *Regulus calendula*. Common.
8. *Parus montanus*. Common.
9. *Sitta Carolinensis aculeata*. Rare.
10. *S. Canadensis*. Rare.
11. *S. pusilla pygmæa*. Rare.
12. *Certhia familiaris fusca*. Rare.
13. *Troglodytes ædon Parkmanni*. Abundant.
14. *Telmatoctes palustris paludicola*. Common.
15. *Eremophila alpestris (chrysolaema?)*. Common.
16. *Helminthophaga celata*. Common.
17. *H. Virginica*. Abundant.
18. *Dendroica æstiva*. Abundant.
19. *D. Auduboni*. Common.
20. *D. nigrescens?* Rare.
21. *Geothlypis Macgillivrayi*. Abundant.
22. *G. trichas*. Rare.
23. *Icteria virens longicauda*. Very rare.
24. *Myiodioctes pusillus*. Rare.
25. *Setophaga ruticilla*. Rare.
26. *Pyrranga Ludoviciana*. Rare.
27. *Progne subis*. Abundant.
28. *Petrochelidon lunifrons*. Common.
29. *Hirundo horreorum*. Common.
30. *Tachycineta bicolor*. Abundant.
31. *T. thalassina*. Common.
32. *Cotyle riparia*. Common.
33. *Stelgidopteryx serripennis*. Common.
34. *Vireosylvia gilva Swainsoni*. Abundant.

35. *Lanivireo solitaria plumbea*. Rare.
36. *Collurio Ludoviciana excubitoroides*. Common.
37. *Carpodacus Cassini*. Abundant.
38. *C. frontalis*. Common.
39. *Chrysomitris tristis*. Rare.
40. *C. psaltria*. Rare.
41. *C. pinus*. Very abundant.
42. *Passerculus savanna alaudinus*. Rare.
43. *Pooecetes gramineus confinis*. Common.
44. *Coturniculus passerinus perpallidus*. Rare.
45. *Melospiza Lincolni*. Common.
46. *M. melodia fallax*. Abundant.
47. *Junco caniceps*. Common.
48. *Spizella socialis Arizonae*. Abundant.
49. *S. Breweri*. Common.
50. *Zonotrichia leucophrys*. Abundant.
51. *Chondestes grammacus*. Common.
52. *Passerella iliaca schistacea*. Abundant.
53. *Calamospiza bicolor*. One specimen.
54. *Hedymeles melanocephalus*. Common.
55. *Cyanospiza amœna*. Common.
56. *Pipilo erythrophthalmus megalonyx*.
57. *P. chlorura*.
58. *Molothrus pecoris*.
59. *Agelaius phœniceus*.
60. *Xanthocephalus icterocephalus*.
61. *Icterus Bullocki*.
62. *Sturnella magna neglecta*.
63. *Scolecophagus cyanocephalus*.
64. *Corvus corax carinivorus*.
65. *Cyanocitta Floridana Woodhousii*.
66. *Cyanura Stelleri macrolopha*.
67. *Picicorvus Columbianus*.
68. *Tyrannus verticalis*.
69. *T. Carolinensis*.
70. *Myiarchus crinitus cinerascens*.
71. *Contopus borealis*.
72. *C. Richardsoni*.
73. *Empidonax obscurus*.
74. *E. flaviventris difficilis*.
75. *E. pusillus*.
76. *Antrostomus Nuttalli*.
77. *Chordelles popetue Henryi*.
78. *Trochilus Alexandri*.
79. *Stellula calliope*?

80. *Selasphorus platycercus*.
81. *Ceryle alcyon*.
82. *Picus villosus* Harrisl.
83. *P. pubescens* Gairdneri.
84. *Sphyrapicus varius nuchalis*.
85. *Sphyrapicus thyroideus*. Rare.
86. *Colaptes auratus Mexicanus*. Common.
87. *Bubo Virginianus arcticus*. Rare.
88. *Falco saker polyagrus*. Rare.
89. *F. sparverius*. Common.
90. *Circus cyaneus Hudsonius*. Rare.
91. *Nisus Cooperi*. Rare.
92. *N. fuscus*. Rare.
93. *Buteo borealis calurus*. Common.
94. *B. Swainsoni*. Abundant.
95. *Archibuteo lagopus Sanctijohannis*. Rare.
96. *Aquila chrysaetos Canadensis*. Common.
97. *Rhinogryphus aura*. Common.
98. *Zenaidura Carolinensis*. Abundant.
99. *Canace obscura*. Abundant.
100. *Bonasa umbellus umbelloides*. Rare?
101. *Centrocercus urophasianus*. Common.
102. *Pediocetes phasianellus Columbianus*. Common.
103. *Ægialitis vociferus*. Common.
104. *Gallinago gallinaria Wilsoni*. Common.
105. *Ereunetes pusillus*. Rare.
106. *Actodromus minutilla*. Rare.
107. *Symphemia semipalmata*. Rare.
108. *Tringoides hypoleucos macularius*. Common.
109. *Rhyacophilus glareola solitarius*. Rare.
110. *Numenius longirostris*. Rare.
111. *Grus Canadensis*. Rare.
112. *Porzana Carolina*. Common.
113. *P. Jamaicensis?* Common.
114. *Fulica Americana*. Rare.
115. *Anas boschas*. Rare.
116. *Querquedula cyanoptera*. Rare.

d. Pack's Cañon, western spur of Uintah range (July 3-8, 1869).

The fauna of this locality was exactly like that of Parley's Park, with the exception that *Cyanura Stelleri macrolopha* was more abundant.

e. Kamas Prairie (July 9, 1869).

The only species seen in this grassy valley, which was not noticed elsewhere, was the *Actiturus Bartramius*.

f. Cañon of the Provo River (July 10, 1869).

The following species not found by us elsewhere were abundant among the willows bordering the river:

1. *Turdus fuscescens*.
2. *Parus atricapillus septentrionalis*.

There were also found *Setophaga ruticilla* and *Galeoscoptes Carolinensis* in plentiful numbers, and *Pica melanoleuca Hudsonica*, which in other localities in Utah was found to be rare or entirely wanting.

CATALOGUE OF THE BIRDS ASCERTAINED TO OCCUR IN NEVADA.

The following is a complete list of the birds known at the present time to occur within the limits of the State of Nevada. The number will doubtless be considerably increased in the course of time, when portions of the state not visited by us shall have been explored. Those marked with an asterisk (*) breed within the limits of the State; those distinguished by a dagger (†) belong to the western portion, and those with a ‡ are more abundant in the eastern part, being stragglers from the Rocky Mountains.

- *1. *Turdus migratorius* L.
2. *T. Pallasi* Cab., *var. nanus* Aud.†
3. *T. Swainsoni* Cab.‡
- *4. *T. Swainsoni* Cab., *var. ustulatus* Nutt.†
- *5. *Oreoscoptes montanus* (Townsend.).
- *6. *Sialia Mexicana* Sw.†
- *7. *S. arctica* Sw.
- *8. *Cinclus Mexicanus* Sw.
- *9. *Regulus calendula* (L.).
10. *R. satrapa* Licht.
- *11. *Lophophanes inornatus* (Gamb.).†
- *12. *Parus montanus* Gamb.
- 13? *P. atricapillus* L., ‡ *var. septentrionalis* Harris.
- *14. *Psaltiriparus minimus* (Townsend.), *var. plumbeus* Baird.
- 15? *Psaltiriparus melanotis* (Hartl.).‡
- *16. *Sitta Carolinensis* Gm., *var. aculeata* Cassin.‡
- *17. *S. Canadensis* L.
- *18. *S. pusilla* Lath., ‡ *var. pygmaea* Vig.
- *19. *Certhia familiaris* L., *var. fusca* Bart.
- *20. *Campylorhynchus brunneicapillus* (Lafr.).
- *21. *Salpinctes obsoletus* (Say).
- *22. *Catherpes Mexicanus* (Sw.), *var. conspersus* Ridgw.

- *23. *Troglodytes aëdon* V., *var. Parkmanni* Aud.
- 24. *T. parvulus* Koch, *var. hyemalis* Wils.
- *25. *Telmatodytes palustris* (Wils.), *var. paludicola* Baird.
- 26. *Anthus Ludovicianus* (Gm.).
- *27. *Helminthophaga Virginiae* Baird.†
- 28. *H. ruficapilla* (Wils.).†
- *29. *H. celata* (Say).
- 30. *H. celata* (Say), *var. lutescens* Ridgw.†
- *31. *Dendroica aestiva* (Gm.).
- 32? *D. occidentalis* (Townsend).
- 33. *D. Townsendi* (Nutt.).
- *34. *D. nigrescens* (Townsend).†
- *35. *D. Auduboni* (Townsend).
- *36. *Geothlypis trichas* (L.).
- *37. *G. Philadelphia* (Wils.), *var. Macgillivrayi* Aud.
- *38. *Icteria virens* (L.), *var. longicauda* Lawr.
- *39. *Myiodiocetes pusillus* (Wils.).
- 40. *M. pusillus* (Wils.), *var. pileolata* Pall.†
- *41. *Pyranga Ludoviciana* (Wils.).
- *42. *Hirundo horreorum* Barton.
- *43. *Tachycineta bicolor* (V.).
- *44. *T. thalassina* (Sw.).
- *45. *Cotyle riparia* (L.).
- *46. *Stelgidopteryx serripennis* (Aud.).
- *47. *Petrochelidon lunifrons* (Say).
- *48. *Frogne subis* (L.).
- 49. *Ampelis cedrorum* (V.).†
- *50. *Phænopepla nitens* (Sw.).
- *51. *Myiadestes Townsendi* (Aud.).
- *52. *Vireosylva gilva* (V.), *var. Swainsoni* Baird.
- 53. *Lanivireo solitaria* (Wils.).
- 54. *L. solitaria* (Wils.), *var. Cassini* Baird.†
- *55. *L. var. plumbeus* Coues.†
- *56. *Collurio Ludovicianus* (L.), *var. excubitoroides* Sw.
- *57. *Carpodacus Cassini* Baird.
- *58. *C. frontalis* (Say).
- *59. *Loxia leucoptera* (Wils.).
- 60. *L. curvirostra* L., *var. Americana* (Wils.).
- 61. *Leucosticte tephrocotis* Sw., *var. littoralis* Baird.
- *62. *Chrysomitris tristis* (L.).
- *63. *C. pinus* (Wils.).
- 64. *Plectrophanes lapponicus* (L.).
- *65. *Passerculus savanna* (Wils.), *var. alaudinus* Bonap.
- *66. *Poocetes gramineus* (Gm.), *var. confinis* Baird.

- *67. *Coturniculus passerinus* (Wils.), *var. perpallidus* Ridgw.
- *68. *Melospiza Lincolni* (Aud.).
- *69. *M. melodia* (Wils.).†
- *70. *var. fallax* Baird.
- *71. *var. Heermanni* Baird.†
- 72. *var. guttata* Nutt.
- *73. *Poospiza bilineata* (Cass.).
- *74. *P. Belli* (Cass.), *var. Nevadensis* Ridgw.
- *75. *Junco hyemalis* (L.), *var. Oregonus* (Townsend).†
- 76. *Spizella monticola* (Gm.).
- *77. *S. socialis* (Wils.), *var. Arizonae* Coues.
- *78. *S. Breweri* (Cass.).
- 79. *Zonotrichia leucophrys* (Forst.).†
- *80. *Z. leucophrys* (Forst.), *var. intermedia* Ridgw.†
- 81. *Z. coronata* (Pall.).†
- *82. *Chondestes grammacus* (Say).
- *83. *Passerella iliaca* (Merrem), † *var. schistacea* Baird.
- *84. *Passerella iliaca* (Merrem), *var. megarhynchus* Baird.†
- *85. *Hedymeles melanocephalus* (Sw.).
- *86. *Cyanospiza amœna* (Say).
- *87. *Guiraca cœrulea* (L.).
- *88. *Pipilo erythrophthalmus* (L.), *var. Oregonus* Bell.†
- *89. *var. megalonyx* Baird.†
- *90. *P. chlorurus* (Townsend.).
- *91. *Eremophila alpestris* (Forst.).
- 92. *E. alpestris* (Forst.), *var. leucolæma* Coues.
- *93. *var. chrysolæma* Wagl.
- 94. *Dolichonyx oryzivorus* (L.), † *var. albinucha* Ridgw.
- *95. *Agelaius phœniceus* (L.).
- *96. *A. phœniceus* (L.), *var. gubernator* Wagl.†
- *97. *anthocephalus icterocephalus* (Bonap.).
- *98. *Molothrus pecoris* (Gm.).
- *99. *Sturnella magna* (L.), *var. neglecta* Aud.
- *100. *Icterus Bullocki* (Sw.).
- *101. *Scolecophagus cyanocephalus* (Wagl.).
- *102. *Corvus corax* L., *var. carnivorus* Bartr.
- 103. *C. Americanus* Aud.
- *104. *Picicorvus Columbianus* (Wils.).
- *105. *Gymnokitta cyanocephala* Max.
- *106. *Pica melanoleuca* V., *var. Hudsonica* Sab.
- *107. *Cyanura Stelleri* (Gm.), † *var. frontalis* Ridgw.
- *108. *Cyanocitta Florida* (Bartr.), *var. Californica* Vig.
- *109. *var. Woodhousei* Baird.†
- *110. *Tyrannus Carolinensis* (L.).

- *111. *T. verticalis* Say.
- *112. *Myiarchus crinitus* (L.), *var. cinerascens* Lawr.
- *113. *Sayornis Sayus* (Bonap.).
- *114. *Contopus borealis* (Sw.).
- *115. *C. Richardsoni* (Sw.).
- *116. *Empidonax pusillus* (Sw.).
- *117. *Empidonax flaviventris* Baird, *var. difficilis* Baird.
- *?118. *E. Hammondi* Baird.
- *119. *E. obscurus* (Sw.).
- *120. *Antrostomus Nuttalli* (Aud.).
- *121. *Chordelles popetue* (V.), *var. Henryi* Cass.
- *122. *Panyptila saxatilis* (Woodh.).†.
- *123. *Nephæcetes niger* (Gm.), *var. borealis* Kennerly.†
- *124. *Chætura Vauxi* (Town.).†
- *125. *Trochilus Alexandri* Bourc.
- *126. *Selasphorus rufus* (Gm.).
- *127. *S. platycercus* (Sw.).
- *128. *Stellula calliope* Gould.
- *129. *Ceryle alcyon* (L.).
- *130. *Coccyzus Americanus* (L.).
- *131. *Picus albolarvatus* (Cass.).†
- *132. *P. villosus* L., *var. Harrisii* Aud.
- *133. *P. pubescens* L., *var. Gairdneri* Aud.
- 134. *Picoides arcticus* (Sw.).
- *135. *Sphyrapicus varius* (L.), *var. nuchalis* Baird.
- *136. *var. ruber* Gm.†
- *137. *S. thyroides* (Cass.).
- *138. *Melanerpes torquatus* (Wils.).
- 139. *Colaptes auratus* (L.), *var. hybridus* Baird.
- *140. *var. Mexicanus* Sw.
- *?141. *C. chrysoides* Malh.
- *142. *Bubo Virginianus* (Gm.), *var. Arcticus* Sw.
- *143. *Otus vulgaris* (L.), *var. Wilsonianus* Less.
- 144. *Nyctale acadica* (Gm.).
- *145. *Speotyto cunicularia* (Mol.), *var. hypugæa* Bonap.
- *146. *Falco communis* Gm., *var. anatum* Bonap.
- *147. *F. saker* Schl., *var. polyagrus* Cass.
- *148. *F. Columbarius* L.
- *149. *Falco sparverius* L.
- *150. *Pandion halliaëtus* (L.), *var. Carolinensis* Gm.
- *151. *Circus cyaneus* L., *var. Hudsonius* L.
- *152. *Nisus Cooperi* (Bonap.).
- *153. *N. fuscus* (Gm.).
- *154. *Buteo borealis* (Gm.), *var. calurus* Cass.

- *155. *B. Swainsoni* Bonap.
- *156. *Archibuteo ferrugineus* (Licht.).
- *157. *A. lagopus* (Brunn.), *var. Sancti-Johannis* Gm.
- *158. *Aquila chrysaetos* (L.), *var. Canadensis* L.
- *159. *Haliaeetus leucocephalus* (L.).
- *160. *Rhinogryphus aura* (L.).
- 161. *Ectopistes migratoria* (L.).†
- *162. *Zenaidura Carolinensis* (L.).
- *163. *Canace obscura* (Say).
- *164. *Bonasa umbellus* (L.), *var. umbelloides* Dougl.‡
- *165. *Pedilœcetes phasianellus* (L.), *var. Columbianus* Ord.
- *166. *Centrocercus urophasianus* (Bonap.).
- *167. *Oreortyx pictus* (Dougl.), † *var. plumifera* Gould.
- *168. *Ægialitis vociferus* (L.).
- *169. *Recurvirostra Americana* Gm.
- *170. *Himantopus nigricollis* V.
- *171. *Steganopus Wilsoni* (Sab.).
- *172. *Gallinago gallinaria* (Gm.), *var. Wilsoni* Temm.
- *173. *Ereunetes pusillus* (L.).
- 174. *Actodromus Bairdi* Coues.
- *175. *A. minutilla* (V.).
- 176. *Pelidna alpina* (L.), *var. Americana* Cass.
- *177. *Symphemia semipalmata* (Gm.).
- *178. *Rhyacophilus glareola* (L.), *var. solitarius* Wils.
- *179. *Tringoides hypoleucus* (L.), *var. macularius* L.
- *180. *Numenius longirostris* (Wils.)
- 181. *Tantalus loculator* L.
- *182. *Ibis guarauna* (Gm.).
- *183. *I. thalassinus* Ridgw.†
- *184. *Ardea herodias* L.
- 185. *Herodias alba* (L.), *var. egretta* Gm.
- *186. *Nyctiardea grisea* (L.), *var. nævia* Bodd.
- *187. *Botaurus minor* (Gm.).
- *188. *Ardetta exilis* (Gm.).
- *189. *Grus Canadensis* (L.).
- *190. *Rallus Virginianus* L.
- *191. *Porzana Carolina* (L.).
- *192? *P. Jamaicensis* (Gm.).‡
- *193. *Fulica Americana* Gm.
- 194. *Cygnus buccinator* Rich.
- 195. *Anser hyperboreus* Pall.
- *196. *Branta Canadensis* (L.).
- 197. *B. Hutchinsi* Rich.
- 198. *B. bernicla* (L.), *var. nigricans* Lawr.

- *199. *Anas boschas* L.
- *200. *Chaulelasmus streperus* (L.).
- *201. *Mareca Americana* (Gm.).
- *202. *Nettion Carolinensis* (Gm.).
- *203. *Querquedula cyanoptera* (V.).
- *204. *Q. discors* (L.).
- *205. *Dafila acuta* (L.).
- *206. *Spatula clypeata* (L.).
- 207. *Aix sponsa* (L.).
- 208. *Fulix marila* (L.).
- 209. *F. marila* (L.), *var. affinis* Eyton.
- 210. *F. collaris* (Donov.).
- 211. *Aythya vallisneria* (Wils.).
- 212. *A. ferina* (L.), *var. Americana* Eyton.
- 213. *Bucephala albeola* (L.).
- 214. *B. clangula* (L.), *var. Americana* Bonap.
- *215. *Erisimatura rubida* (Wils.).
- 216. *Mergus merganser* (L.), *var. Americanus* Cass.
- 217. *Mergus serrator* L.
- 218. *Lophodytes cucullatus* (L.).
- *219. *Pelecanus erythrorhynchus* Gm.
- *220. *Graculus dilophus* (Sw.).
- *221. *Larus argentatus* Brünn., *var. Californicus* Lawr.
- 222. *L. Delawarensis* Ord.
- *223. *Sterna regia* Gambel.
- *224. *S. Forsteri* Nutt.
- *225. *Hydrochelidon fissipes* (L.).
- *226. *Æchmophorus occidentalis* (Lawr.)
- *227. *Podiceps auritus* (L.), *var. Californicus* Heerm.
- *228. *Podilymbus podiceps* (L.).

Total number of species known to breed in Nevada, 179.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 7. SALEM, MASS., MARCH, 1875. No. 3.

One Dollar a Year in Advance. Ten Cents a Single Copy.

QUARTERLY MEETING, WEDNESDAY, FEB. 10, 1875.

MEETING this afternoon at three o'clock. VICE PRESIDENT F. W. PUTNAM in the chair. Records of the preceding quarterly and regular meetings were read.

Frank L. Smith, of Salem, was elected a resident member.

Mr. PUTNAM mentioned that the Misses Mary E. and Abby O. Williams, of Salem, would be willing to deposit, in the rooms of the Institute, temporarily, their valuable collection of paintings, many of which were copied by them from the "old masters," during a residence in Rome of several years.

After some conversation, the subject was referred to the Curators of the Department of Art, to make such arrangements with the Misses Williams as may be deemed advisable; on the understanding that the collection shall be

properly cared for by the curators, and that the Institute be not held responsible in case of fire or accident; also to tender to the Misses Williams the sincere thanks of the Institute for this liberal proposal.

The committee appointed at a previous meeting presented as their report a new draft of the Constitution and By-laws of the Institute. After some discussion it was

Voted, That a copy of the report be placed in the rooms of the Institute, and that the same be presented at the Annual Meeting in May, for further action.



REGULAR MEETING, MONDAY, FEBRUARY 15, 1875.

MEETING this evening at 7.30 o'clock. VICE PRESIDENT F. W. PUTNAM in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From E. J. Attinelli, New York, Feb. 6; Francis H. Appleton, Boston, Feb. 13; Charles H. Bell, Exeter, N. H., Feb. 5; E. P. Boon, New York, Feb. 2; John M. Bradbury, Ipswich, Feb. 1, 4; C. H. Dall, Boston, Feb. 13; W. H. Dall, Washington, Feb. 1; George Haskell, Ipswich, Feb. 11; A. H. Hoyt, Boston, Feb. 8; Joseph K. Jenness, Haverhill, Feb. 12; Jacob Leamon, Croton, Ohio, Jan. 25; J. H. Leavitt, Feb. 2; E. J. Maynard, Newtonville, Feb. 11; Henry Morton, Hoboken, N. J., Jan. 26; J. W. Moulton, Feb. 10; Nathaniel Paine, Worcester, Feb. 12; W. S. Perry, Geneva, N. Y., Feb. 9; B. Perley Poore, Indian Hill Farm, near Newburyport, Feb. 1; Cyrus Woodman, Cambridge, Feb. 10; Bern, Die Naturforschende Gesellschaft, Aug. ; Dresden, K. Leopoles caro, Deutschen Acad. der Naturforschende, Nov. 17; Emden, Naturforschende Gesellschaft, Sept. 11; Freiburg, Die Naturforschende Gesellschaft, Sept. 8; Genève Société de Physique et d' Histoire Naturelle, Sept. 15; Neuchatel Société des Sciences Naturelles, Oct. 12; Yale College, Feb. 9; Zurich, Naturforschende Gesellschaft, Oct. 1.

The LIBRARIAN reported the following additions to the library:—

By Donation.

- BOLLES, E. C. Miscellaneous pamphlets, 5.
 HUMPHREYS, Brig. Gen. A. A. Annual Report of the Chief of Engineers. Pts. 1, 2, 1874. 2 vols. 8vo.
 LEE, JOHN C. Commercial Bulletin, Jan. 2, 9, 15, 1875.
 MASS. HORTICULTURAL SOCIETY. Schedule of Prizes offered by the Mass. Horticultural Society for 1875.
 PEABODY INSTITUTE, Danvers. Seventh Annual Report of the Trustees of the, Year ending March 31, 1874.
 PHILLIPS, CHAS., of Germantown, Penn. Railroad Report of Penn., 1863. 1 vol. 8vo. The American Historical Record, 8 numbers. Miscellaneous pamphlets, 91. Almanacs, 1870, 1871.
 PUTNAM, H. W. Directory of Peabody, Danvers, Marblehead, 1873. 1 vol. 8vo. N. E. Business Directory, 1873. 1 vol. 8vo. Essex County Directory, 1873. 1 vol. 8vo. Mass. Register and Business Directory, 1873. 1 vol. 8vo.
 ROPES, W. L., of Andover, Mass. Catalogue of Andover Theol. Seminary, 1874-75.
 U. S. PATENT OFFICE. Official Gazette, Jan. 5, 12, 1875.
 WATERS, J. L. Miscellaneous pamphlets, 50.
 WILLIAMS, JAMES, of Columbus, Ohio. Annual Report of the Auditor of the State of Ohio, 1874. 1 vol. 8vo.

By Exchange.

- ACCADEMIA D' AGRICOLTURA COMMERCIO ED ART DI VERONA. Memoire, Vol. L, II Serie, Fasc. II, 1874. Vol. L, II Serie, Fasc. I, II, 1874.
 CROSSE ET FISCHER. Journal de Conchyliol. 3e Série, Tome xiv, No. iv, 1874.
 INSTITUT HISTORIQUE, PARIS. L' Investigateur. 40 Année. No. vi, Nov., 1874.
 KAISERLICHE LEOPOLDINISCH-CAROLINISCHE DEUTSCHEN AKADEMIE DER NATURFORSCHER IN DRESDEN. Leopoldina, Heft vii, viii, ix, 1871, 1872, 1873.
 NATURFORSCHENDE GESELLSCHAFT IN BERN. Mittheilungen, Nos. 812-827, 1873.
 NATURFORSCHENDE GESELLSCHAFT IN FREIBURG. Berichte, Band vi, Heft II, III, 1873. 2 pamphlets.
 NATURFORSCHENDE GESELLSCHAFT, ZURICH. Vierteljahrsschrift, Jahrg. xviii, 1873.
 NATURFORSCHENDE GESELLSCHAFT IN EMDEN. Jahresbericht, 1873. 8vo. 1874.
 NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. New England Historical and Genealogical Register, Jan., 1875.
 SOCIÉTÉ D' ACCLIMATION, Paris. Bulletin Mensuel, 3me Série, Tome i, No. 10, Oct., 1874.
 SOCIÉTÉ D' ANTHROPOLOGIE, Paris. Bulletins, Tome ix, 11e Série, 2e Fascicule, 1874.
 SOCIÉTÉ DES SCIENCES NATURELLES, Neuchâtel. Bulletin, Tome x, 1873-4. Memoires, Tome iv, 2nd pt., 1874.
 SOCIÉTÉ DE PHYSIQUE ET D' HISTOIRE NATURELLE, Genève. Memoires, Tome xxiii, 2nd pt., 1873-74.
 PUBLISHERS. American Journal of Science. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Hardwicke's Science-Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Public Spirit. Sailors' Magazine and Seamen's Friend. Salem Post. Salem Observer.

Mrs. C. A. Carlton, of Salem, was elected a resident member.

REV. GEORGE BATCHELOR presented a memoir of our late associate, Hon. BENJAMIN F. BROWNE, of Salem. Referred to the publication committee.

Mr. JOHN ROBINSON read the following paper, illustrating the same with diagrams and specimens :—

FERNS OF ESSEX COUNTY, MASS.

ONE of the most important objects of the Essex Institute is the collecting and investigation of Essex County products of every sort. Oakes, Russell, Nichols, Fowler, Putnam, Packard, Hyatt, Tracy and others have each in turn worked at this, and all seem to have agreed in leaving the ferns for some one else to look up. The rocks, insects, fishes, birds, mammals, early inhabitants and Indian remains, flowering plants, mosses, and lichens, have been more or less fully reported upon ; but the ferns, even so abundant and conspicuous as they are, were omitted. Searching the publications of Essex County societies, no notice or list of ferns is to be found ; even Tracy's "Plants of Lynn" stops just upon them. I have for some years been interested in these curious and beautiful plants, and have given special notice to those in our county and have searched myself with friends in the following localities, thoroughly or in part :—Lynn, Swampscott, Saugus, Lynnfield, Danvers, Peabody, Salem, Beverly, Manchester, Essex, Gloucester, Rockport, Ipswich, Newbury, North Andover, Bradford, Wenham, Topsfield, Marblehead, Groveland, Middleton, and have had the assistance of Mrs. C. N. S. Horner, of Georgetown, who kindly gives me the localities for that region, about which I know very little myself.

Among the older botanists, now gone, who gave ferns some particular notice, was William Oakes, of Ipswich, and judging from looking over the beautifully prepared

specimens he left to tell of his earnest labor as a botanist, I should think he had noticed about two-thirds of our county ferns.

The arrangement in this paper is according to Gray's botany, fifth edition, where full descriptions of each species will be found.¹

We have represented in the county, so far as is now known, sixteen genera, including twenty-nine species and about eight book varieties. A very few species may possibly be added after a careful search, but that is extremely doubtful.

I will take these species in order, and notice each separately, commencing with :—

1. ONOCLEA SENSIBILIS L.

Sensitive Fern.

So called on account of the habit of quickly turning black after the first frosts. The fertile and sterile fronds are entirely different in appearance, the former not showing themselves till August and then becoming rigid and remaining perfect almost through a second season, while the sterile fronds commence to unfold early in May, are very broad, and perish at the first frost. Common everywhere.

2. A very curious abnormal form is the var. *obtuselobata* of Torrey, not a true variety but only an occasional state of a frond of the ordinary plant. This illustrates how the sterile and fertile fronds in dimorphous ferns can be shown to resemble each other and is only a half-way state between sterile and fertile, so to speak. Frequent, with No. 1.

3. STRUTHIOPTERIS GERMANICA Willd.

Ostrich Fern.

This is the tallest of all New England ferns, growing to a height of six feet, and yet it is one of the most graceful of our species. It is not coarse, and spreads by numerous underground runners, filling whole fields in parts of New Hampshire and Vermont, where I have

¹ It should be noted that this paper was illustrated by perfect herbarium specimens of each species and variety referred to, rendering botanical descriptions unnecessary. English names are added for each species, though many are poor enough.

walked among plants, though not of the largest growth, with only my head above them. Like the last, the fruit spike is separate and rigid, often found the second year black and persistent, while the spikes of that season are new and green. I included this in the list of Essex County ferns, as the place from which I knew it was but just beyond the county line in North Reading, towards Middleton, not nearer one town than the other. I have since heard from Mrs. Horner, who reports it from Georgetown; she, therefore, is first to add this truly noble fern to our county list.

4. *WOODSIA ILVENSIS* R. Br.

Hairy Woodsia.

This is a rare fern in Europe, but here is very abundant, particularly on the hills about Salem. A short, woolly plant growing in tufts. It is found in Danvers, Swampscott, Wenham, and in fact in almost every hilly town.

5. *WOODSIA OBTUSA* Torrey.

Blunt Woodsia.

Not so abundant as the last, taller and more delicate. The small forms resemble *Cystopteris fragilis*, with which it often grows. There is a fine locality for this at Peabody, on the Swampscott road, and it is to be found in Salem pastures, Beverly, Middleton and elsewhere.

6. *DICKSONIA PUNCTILOBULA* Kunze.

Hay-scented Fern.

This is the only American representative of a genus which in the tropics boasts of the noblest of tree ferns, including the *D. antarctica* of Tasmania, the trunk of which rises to the height of thirty or forty feet, crowned by a circle of enormous fronds, some even twenty feet to their tips. Our humble Dicksonia is one of our most common and yet most beautiful ferns. It grows by creeping, underground stems, and sometimes is found with fronds three or four feet high; the fruit is very small on the little lobes of the pinnules, the fronds are much dissected and almost always widest at the base. When crushed it has a very pleasant aromatic odor, and after a frost this is quite noticeable in the woods where the plants grow.

7. *CYSTOPTERIS FRAGILIS* Bernh.

Delicate Bladder Fern.

This will be found in old stone walls where the earth is banked up high at the back, and in damp, rocky woods or ravines. There are many fine localities in Salem, Beverly, Essex, Swampscott and else-

where. This is an early fern and often in dry seasons by August the fruit will have perfected and the fronds entirely have disappeared (it should be looked for in June). I found at Essex in September, 1873, a plant that, thinking the dry summer was its winter rest, had with the September rains again started; I collected several fine young fronds at that late date.

This varies considerably; the less cut form is var. *dentata*, but not approving of naming every variation, as some seem to do, the most prominent ones only are given in this list.

8. ADIANTUM PEDATUM L.

Maiden Hair.

By many considered our most beautiful fern, and when seen in the grand clumps two feet or more high, as I have seen them in this county at the fine locality in North Andover, one can hardly find in any conservatory a more elegant, graceful or delicate fern. It grows sparingly in Salem, Danvers, Lynnfield, Georgetown and some other places. In the western part of this state, Vermont and southward, it is found by the acre. It varies but slightly even in Californian specimens.

9. PTERIS AQUILINA L.

Eagle Fern. Bracken.

Common along railroad tracks and gravelly places skirting and in the woods. This is in England one of the rankest growing ferns, sometimes attaining a height of twelve feet. I think six feet from the ground to the tip, when lifted up, is the extreme that has been noticed here. Most beautifully crisped forms and often strange developments of the pinnules may be found in the county specimens, some of which approach the var. *caudata* which grows south.

10. WOODWARDIA VIRGINICA Smith.

Chain Fern.

(The fruit upon the underside of the fertile pinnules is in short lines, resembling the links of a chain.)

In searching for this fern I spent three days before finding it in a locality now nearly destroyed, known to Mr. Russell. Since then I have found it growing profusely around many ponds or in swamps at Beverly, Hamilton, Essex, Manchester, Wenham, Georgetown (Mrs. Horner), etc. This is the only fern I have ever observed growing under water. Many grow near the water, but this I have repeatedly found growing, even at low water seasons, with the rhizome creeping

out into the pond, with little if any earth over it, which seems at variance with the rest of the ferns hereabouts.

11. ASPLENIUM TRICHOMANES L.

Dwarf Spleenwort.

A charming little fern growing upon the rocks, with its black, thread-like roots working their way so deep into the crevices that it is with difficulty removed without breaking them off. This varies greatly in size, but in the cutting very slightly. Not rare; good localities in Peabody, Marblehead, Georgetown, etc.

12. ASPLENIUM EBENEUM Ait.

Ebony Spleenwort.

Found in pine woods near rocks, but not so much on and in them as No. 11, which in general style it resembles, although never to be mistaken for it. A much serrated form is frequently met with, and the fronds are often found split, forming a double apex. Found in nearly every town; fine localities in Beverly, Essex, etc.

13. ASPLENIUM THELYPTEROIDES Michx.

Silvery Spleenwort.

This is a rare fern with us but very abundant in Vermont and western Massachusetts, particularly near the eastern end of the Hoosac tunnel, on the path to the "twin cascades." The fruit on the fertile pinnules is very regular and distinct, a very beautiful object under the microscope. The only plant I know of this is at Swampscott. It is at Georgetown (Mrs. Horner), Lynnfield (Russell), and "with Mr. Oakes it was a favorite fern and found by him at Ipswich." (Prof. Tuckerman.)

14. ASPLENIUM FILIX-FEMINA Bernh.

Lady Fern.

The most abundant and variable of all our ferns, except, perhaps, *Aspidium spinulosum*. It grows everywhere, in sun and shade, and often so much fruited that the fronds will look black. It sometimes is found nearly four feet high, and one quite marked variety has the lower pinnae as long, if not longer than the rest, while in the common form they are conspicuously reduced.

Some will confound this with *Dicksonia*, when not in fruit, and with *Aspidium spinulosum*, but the difference will be readily seen upon examination. Common everywhere.

15. *ASPIDIUM ACROSTICHOIDES* Swartz.*Christmas Fern.*

It is found abundantly near the first pond on the road to the Chebacco house, Essex: also in Beverly woods; near the turnpike and floating bridge; Andover; Danvers, etc. This is a rigid, evergreen species, and is very abundant north and south; one of the best for decorative purposes, as it keeps well. There is some variation to the cutting of the fronds, and one is called var. *incisum*. The peculiar fruiting of this fern distinguishes it from all others of our species, hence the name *acrostichoides*, for the fruit dots becoming confluent, the pinnae curl, and the whole looks as if one mass of spore cases, as it is with the genus *Acrostichum*, hence resembling *Acrostichum*, or *Acrostichoides*.

16. *ASPIDIUM THELYPTERIS* Swartz.*Marsh Fern.*

Formerly this fern was confused with *A. Noveboracense*, but the conspicuously reduced pinnae of the latter, as well as the lighter color, should have been noticed as distinguishing points; it is also quite different in the fruiting. Found in every meadow and by every roadside as well as in deep woods and in bogs. Perfect specimens can be found in full fruit from *six inches to five feet high*, and from one inch to one foot wide. Where it grows exposed to the sun the pinnae are curled up and quite angular, while in the shade they are less fruited, wide spreading and more delicate.

17. *ASPIDIUM NOVEBORACENSE* Swartz.*New York Fern.*

More delicate than the last, not revolute when well fruited, and growing in less wet places. Common in the woods. By the latter part of September this and the *Dicksonia* become, under favorable circumstances, pure white, and form a very beautiful addition to the decorating ferns for winter.

18. *ASPIDIUM SPINULOSUM* Swartz.*Prickly Toothed Wood Fern.*

This is the typical form of a most protean species, varying from plants perfectly fruited only *six inches high* to heavy forms *four feet high*; and in width from *six inches* on a plant *four feet high* to more than a foot on a plant but *two feet high*. And here is not all; the variations in cutting are as great as those of height and width. We

find it not twice pinnate and fully three times so, with fruit scarcely visible, and dots so large as to be plainly seen at quite a distance. Sometimes the lower pinnæ are much reduced, sometimes very much extended. To take prominent varieties one would at a glance pronounce them very different species, so much more do they vary in appearance than many species which are distinct; but I can show a suite of specimens which run so gradually from one to another that it will at once be seen that to draw a separating line would be quite impossible, and the best that can be done is to name the prominent forms as varieties. The typical plant is rare and as yet I have only found it at Essex. Doubtless other localities will be discovered.

19. Var. *intermedium*. The common form will be found in nearly every patch of woods.

20. Var. *dilatatum* is a larger and more cut form, most common at the mountain regions of New Hampshire. A near approach to it can be obtained at Essex, Beverly, Georgetown (Mrs. Horner), etc.

21. Var. *Boottii* is much more narrow, reduced at the base. This, to judge from the specimens I find, which are very numerous, seems to resemble much more closely *A. cristatum* than *A. spinulosum*. The sterile fronds particularly resemble each other in these two species and it is often very difficult to decide to which they belong. Is it possible that this can be a hybrid between *A. spinulosum* and *A. cristatum*? Found in shady, swampy land.

22. ASPIDIUM CRISTATUM Swartz.

Crested Buckler Fern.

Not so common as some varieties of the last. It grows in similar localities, but seldom more than one or two clumps in a place together. The fertile fronds are usually much taller than the sterile and perish during the winter, while the sterile ones of the previous year are found quite perfect the next spring.

Found in nearly every town in localities similar to the last.

23. ASPIDIUM MARGINALE Swartz.

Marginal or Evergreen Wood Fern.

(So called as the fruit is close to the edge or margin of the pinnule, and the fronds are often found as perfect in spring as they were before winter came.)

This fern is of a beautiful blue-green and is found in rocky woods, where the foliage is not thickest. The fronds are twice pinnate and occasionally found still more cut. Eight years since I collected in Swampscott a plant with very broad and much cut fronds. This I

have had under cultivation ever since. It keeps its distinct character, which is strikingly different from the ordinary form. For convenience I have ticketed herbarium specimens from this as var. *elegans*. Small forms scarcely six inches high and perfectly fruited are often met with.² It grows in almost every town in the county.

24. POLYPODIUM VULGARE L.

Common Polypody.

One of our most common ferns, found on rocks and in mossy woods. This fern has a great many curious forms and in the English fern books as many as twenty varieties are described, but as it is useless to undertake to book varieties which are likely to rise to the hundreds it is best to throw out all but those which are well established as being sufficiently different from the typical form and constantly remain so. Found everywhere.

25. PHEGopteris POLYPODIOIDES Fée.

Beech Fern.

Grows in the Essex woods and I have found it in two places in Common lane, Beverly; it grows in Danvers (Miss Page). This is a White and Green Mountain fern and, with the next, is rare here. These two species of *Phegopteris* usually are found in about the same localities, growing together in Essex, and quite near each other in Beverly. This one almost runs into *P. hexagonoptera* which occurs about us, and which I hope may yet be found here.

26. PHEGopteris DRYopteris Fée.

Oak Fern.

This as the last is a mountain fern and is found in localities with it. Both are European Ferns as well as American. Found in Essex, Beverly, Georgetown (Mrs. Horner).

27. OSMUNDA REGALIS L.

Royal Flowering Fern.

Common in almost all meadows. Sometimes six feet high. Called flowering fern on account of its having the upper pinnæ changed to a

² This comes nearer being a tree fern than any of our species, the caudex covered by the bases of the fronds of previous seasons, sometimes resting upon bare rocks for four or five inches without roots or fronds.

spike of fruit. Sometimes it will be found with fertile and sterile pinnae on the same little division of the frond.

28. *OSMUNDA CLAYTONIANA* L.

Interrupted Flowering Fern.

(So called as the fruit is found in the middle of the frond, with sterile pinnae above and below the fruited ones.) A sterile frond closely resembles that of the next, but is more delicate, broader towards the top, and the segments more rounded. Specimens are found fruited nearly all the way up from the base and one I believe clear to the top. Common; fine localities in North Andover, Topsfield and Salem.

29. *OSMUNDA CINNAMOMEA* L.

Cinnamon Fern.

(So called from its color when coming into fruit.) Familiar to all in pastures and by the roadside, throwing up its tall spikes of fruit in the centre of a whorl of sterile fronds. Often when in the shade I have found sterile fronds of this six feet long.

30. Var. *frondosa* is a state where a portion of the sterile frond becomes fertile, very curiously imitating the fertile fronds of No. 28. Found everywhere.

31. *LYGODIUM PALMATUM* Swartz.

Climbing Fern.

Found at Saugus. I have not searched for it myself, but add it on the authority of Mr. G. E. Emery, of Lynn, a specimen being in the Institute collection from him.³ All know this fern, and a description is unnecessary. Judging by the way it is sold in Boston one can hardly help thinking that if the practice of tearing it up so recklessly continues, it will soon be quite scarce, even at the Windsor and Concord localities.

32. *OPHIOGLOSSUM VULGATUM* L.

Adder's Tongue Fern.

I know of but one locality for this in the county, in Beverly, where it was first noticed by J. H. Emerton, 1872. No doubt others are to be found, as owing to its inconspicuous habits the fern is easily overlooked. Meadows and wet ground about the clumps of bushes and hummocks are the places to be searched for it.

³ The above locality is endorsed by Mr. C. M. Tracy.

33. BOTRYCHIUM TERNATUM Swartz.

Ternate Grape Fern.

The Botrychiums form one of the most interesting genera of ferns we here have represented. There are but ten recognized species of Botrychium known in the world, seven of which grow in America. Our two larger forms are very distinct, but the smaller ones seem to run into each other, though there are distinctions not at once noticeable to a casual observer. *B. ternatum* has two perfect fronds, one sterile and one fertile, distinct to the ground. The typical form is found in California growing to great size, while here the fertile frond seldom exceeds ten inches in height, with a sterile frond five inches across. Found at Essex, 1872-4.

34. Var. *lunarioides* has more rounded segments than the typical. The finest specimen I ever saw was found by Mrs. Horner, in Georgetown.

35. Var. *obliquum*. The segments are longer, and are quite oblique to the rachis.

36. Var. *dissectum*. The whole frond is cut and recut till almost entirely reduced to points. Nos. 34, 35, 36, are found both in wet shady places, and in pastures.

37. BOTRYCHIUM VIRGINIANUM Swartz.

Rattlesnake Fern.

Found in Beverly, and also in Georgetown (Mrs. Horner). This beautiful and delicate fern is the largest of all the Botrychiums and is found from Canada to the tropics. Not rare, yet (owing to its never spreading except by spores) it is seldom found abundant except as a number of specimens scattered through the woods. In this the fertile spike is on the same stalk with the sterile frond, all the limbs springing from a common centre much above the ground. There are one or two of the small species of Botrychium which possibly may be found in the county.

FERNS THAT POSSIBLY MAY YET BE FOUND GROWING
NATURALLY IN ESSEX COUNTY, MASS.

1. WOODWARDIA ANGUSTIFOLIA Smith. Now found in Hingham and Dedham.
2. PHLEGOPTERIS HEXAGONOPTERA Fée. Found in Portland, Brattleboro and South.
3. ASPIDIUM CRISTATUM var. CLINTONIANUM D. C. Eaton. Found in Vermont and New Hampshire.

4. *ASPIDIUM GOLDIANUM* Hook. Found in New Hampshire, Vermont and Connecticut.
5. *BOTRYCHIUM SIMPLEX* Hitch. Found on Long Island, Deerfield, Mass., etc.
6. *BOTRYCHIUM MATRICARIÆFOLIUM* A. Br. Found in New Hampshire, New York, Dedham, Mass.
7. *BOTRYCHIUM LANCEOLATUM* Angström. Found in Sudbury, Mass., etc.

LYCOPODS FOUND IN ESSEX COUNTY.

- LYCOPODIUM LUCIDULUM* Michx. Essex, Peabody, Georgetown.
L. INUNDATUM L. Beverly, Beaver pond; Chebacco pond.
L. ANNOTINUM L. Chebacco woods (1872, J. R.); probably the locality of this rare species was known to Wm. Oakes about 1840.
L. DENDROIDEUM Mx. also *var. obscurum*. Common in almost every town.
L. CLAVATUM L. Common North Andover, Georgetown, Essex, Beverly, etc.
L. COMPLANATUM L. Very common, including a variety.
SELAGINELLA APUS Spring. West Boxford and Georgetown, abundant (Mrs. Horner).
S. RUPESTRIS Spring. Common on rocky, bare hills.

HYDROPTERIDES.

- MARSILIA QUADRIFOLIA* L. Has become fully established in a little pond by Leggs Hill, where it was planted years ago by Mr. Russell (S. B. Buttrick).

EQUISETACEÆ.

- EQUISETUM ARVENSE* L. Common everywhere.
E. SYLVATICUM L. Not rare in the woods.
E. LIMOSUM L. Wenham, Topsfield, etc.
E. HYEMALE L. Danvers (J. H. Sears.)



REGULAR MEETING, MONDAY, MARCH 1, 1875.

MEETING this evening at 7.30 o'clock. VICE PRESIDENT F. W. PUTNAM in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From Mary J. Safford Blake, Boston, Feb. 20; John M. Bradbury, Ipswich, Feb. 24; J. Colburn, Boston, Feb. 20; C. F. Crocker, Lawrence, Feb. 17; S. G. Drake, Boston, Feb. 25; S. A. Green, Boston, Feb. 27; Frederick A. Lucas, Rochester, N. Y., Feb. 28; Alfred Osgood, Newburyport, Feb. 24; Nathaniel Paine, Worcester, Feb. 19; A. A. Scott, Saugus, Feb. 18; Boston Public Library, Feb. 25; Buffalo Historical Society, Feb. 25; Portland Institute, Feb. 18; Worcester Lyceum and Natural History Association, Feb. 24.

The LIBRARIAN reported the following additions to the library:—

By Donation.

BOLLES, E. C. Sunday School Helper, 63 numbers. Christian Leader, 12 numbers. Sunday School Journal, 5 numbers. Sunday School Teacher, 3 numbers. Miscellaneous pamphlets, 27.

BROOKS, H. M. Woman's Journal, Apr., June, July, Aug., Oct., Nov., Dec., 1874.

CITY OF BOSTON. City Documents, 1874. 3 vols. 8vo.

CUTTER, A. E., of Charlestown, Mass. Ninth Annual Report of the Winchester Home Corporation for Aged Women, Jan., 1875. 8vo pamph.

FOOTE, H. W., of Boston, Mass. Sermon preached at King's Chapel, Sunday, Jan. 3, 1875. 8vo pamph.

GREEN, S. A., of Boston, Mass. Miscellaneous pamphlets, 70.

LEE, JOHN C. Commercial Bulletin, Feb. 13, 20, 27, 1875.

MASS. CHARITABLE MECHANIC ASSOCIATION. Twelfth Exhibition of the, Sept. Oct., 1874. 8vo pamph.

By Exchange.

AMERICAN PHILOSOPHICAL SOCIETY. Proceedings of. Vol. xiv. June-Dec. No. 93. 1874.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Proceedings of the, Jan. 6, 1875. 8vo pamph.

WISCONSIN ACADEMY. Transactions of the. Vol. II, 1873-4.

PUBLISHERS. Forest and Stream. Gloucester Telegraph. Hardwicke's Science-Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Medical and Surgical Reporter. Nation. Nature. Peabody Press. Quaritch's Catalogue. Salem Post.

After remarks by the chair in relation to the very interesting photographs of ancient stone houses on the cliffs of the Mancos Valley, which had been taken by Messrs. Jackson and Ingersoll, of the Hayden Expedition, it was

Voted, To invite Mr. ERNEST INGERSOLL, of the Hayden Expedition, to give an illustrated lecture on the recent archæological discoveries of the expedition.

Mr. PUTNAM then called Dr. G. A. PERKINS to the chair, and occupied the evening by giving an account of the fortifications, and other enclosures, made by the Indians and the older races in North America. First, calling attention to the fortifications which, from historical evidence, were known to have been made and occupied by the different Indian tribes at the early period of the settlement of North America by the white race, he described their characteristic structure, which, generally, was that of low earth embankments, with, or without, an outside ditch, and these embankments were generally surmounted by palisades. In other instances the walls were of stone in the place of earth, and in many forts palisades were used without additional defence. He then described those which, for several reasons, were considered as having been erected by the mound builders. These were, so far as yet known, confined to the great Mississippi valley, the Ohio valley, and the southern and south-western parts of the country. These structures are far more imposing than those made by the Indians, and are built with more regard to permanence. Many are so situated as to have formed almost impregnable positions, and we cannot but believe that their defenders must have maintained them for years, until finally they were forced, by continued battles and probably from lack of subsistence, to migrate farther to the southwest, or were so reduced by starvation as to become exterminated.

Many interesting comparisons were made between the fortifications in different parts of the country, and also those of South America, the Pacific Islands and the ancient parts of the old world, showing that in all lands, and during nearly all time, there had been a continued system of warfare and extermination of races.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 7.

SALEM, MASS., APRIL, 1875.

No. 4.

One Dollar a Year in Advance. Ten Cents a Single Copy.

CATALOGUE OF THE FIRST ART EXHIBITION, MARCH, 1875.

No.		Contributor.	Artist.
1	Marriage of St. Catherine.*	Mary E. Williams.	Antonio Balestra.
2	View from Taormina in Sicily, looking towards Messina.*	"	A. O. Williams.
3	Copy of St. Margaret dispelling the Dragon with the Cross in the Church of San Pietro in Vincoli at Rome, by Guercino.*	"	Mary E. Williams.
4	Copy of the Madonna Enthroned, by Pinturicchio, at Perugia.*	"	Mary E. Williams.
5	Copy of the Marriage of St. Catherine by Murillo in the Vatican Gallery.*	"	Mary E. Williams.
6	View of Ischia from Capri.*	"	A. O. Williams.
7	Erethrean Sibyl.*	"	Mary E. Williams.
8	View on the Road to Vallombrosa.*	"	A. O. Williams.
9	Lake Como from San Giovanni.*	"	A. O. Williams.
10	Lake Maggiore from Baveno.*	"	A. O. Williams.
11	Lake Como from Bellagio.*	"	A. O. Williams.
12	Study of Capuchin Monks.*	"	Mary E. Williams.
13	Sans Souci.*	"	Mary E. Williams.
14	View of Sorrento and Bay of Naples.*	"	A. O. Williams.
15	Un Bajocco per Carità.*	"	Mary E. Williams.
16	A Roman Maiden.	"	Mary E. Williams.
17	Heidelberg Castle and Town.*	"	A. O. Williams.
18	Cloister Life in the Olden Time.*	"	Mary E. Williams.
19	The Roman Forum at Sunset; view from the Capitol.*	"	Moretti.
20	Copy of some Angels in the Coronation of the Virgin, by Raphael, in the Vatican.*	"	Mary E. Williams.
21	View of Mount Ætna from Taormina.*	"	A. O. Williams.
22	Roman Beggar.*	"	Mary E. Williams.
23	View of Tivoli and its Falls.*	"	A. O. Williams.
24	Study of an Arab, from life.*	"	Mary E. Williams.
25	Roman Peasant Girl.*	"	Mary E. Williams.

No.		Contributor.	Artist.
26	Tomb of Cecilia Metella and the Via Appia looking towards Rome.*	Mary E. Williams.	A. O. Williams.
27	Study of an Arab's Head, from life.*	"	Mary E. Williams.
28	Little Wild Flower.*	"	Mary E. Williams.
29	Bay of Salerno; view on the road to Amalfi.*	"	A. O. Williams.
30	Palermo.*	"	A. O. Williams.
31	American Autumn.*	"	A. O. Williams.
32	Old Joanna.*	"	Mary E. Williams.
33	The Alchemist.*	"	Mary E. Williams.
34	The Tenants of our Kitchen.*	"	Mary E. Williams.
35	Italian Kitchen.*	"	Mary E. Williams.
36	Angel of the Annunciation; copied from Pinturicchio.	"	Mary E. Williams.
37	Madonna; copied from Pinturicchio.	"	Mary E. Williams.]
38	Papyrus growing on the River Anapo in Sicily.*	"	A. O. Williams.
39	Saracenic Tombs at Taormina.	"	A. O. Williams.
40	Stella, Roman Costume.*	"	Mary E. Williams.
41	Roman Peasant.*	"	Mary E. Williams.
42	Pifferaro.*	"	Mary E. Williams.
43	Capuchin Monk.*	"	Mary E. Williams.
44	Star Grass.	"	Mary E. Williams.
45	Fringed Gentian.	"	Mary E. Williams.
46	Mallows.	"	Mary E. Williams.
47	Lady's Slipper.	"	Mary E. Williams.
48	Mountain Laurel.	"	Mary E. Williams.
49	Lysimachia and Lobelia.	"	Mary E. Williams.
50	Harebell.	"	Mary E. Williams.
51	Painted Cup.	"	Mary E. Williams.
52	Cardinal Flower.	"	Mary E. Williams.
53	Closed Gentian.	"	Mary E. Williams.
54	Gay Feather and Burnett.	"	Mary E. Williams.
55	Nodding Lily.	"	Mary E. Williams.
56	Meadow Lily.	"	Mary E. Williams.
57	A Copy by Farrar, from a Water Color Sketch by Jno. W. Turner.*	G. L. Chandler.	
58	A view on the Androscoggin River in Bethel, Me., a sketch in oils by Butman.*	"	F. W. Butman.
59	Crayon drawing from a cast of an antique head.	"	G. L. Chandler.
60	Millbrook Falls—Thornton, N. H.—pencil sketch.	"	G. L. Chandler.
61	Water color drawing; Lake Winnipisauke.*	"	Wheelock.
62	Landscape.*	"	S. L. Gerry.
63	Landscape.*	"	W. A. Gay.
64	Photograph from a portrait.*	"	W. M. Hunt.
65	Etching, by Vandyke; portrait of Paul Pontius.	"	Vandyck.
66	Photograph from a portrait of the Duke d'Olivares.	"	Velasquez.
67	Paul preaching at Athens; engraving by Dorigny, after Raphael.	"	Raphael.
68	Landscape.*	"	R. H. Fuller.
69	The Transfiguration; engraved by Dorigny after Raphael.*	"	Raphael.
70	Landscape; engraved by Woollett, after Claude.*	"	Claude.
71	Engraving: "Comfort the Fatherless and the Widow," from a design by Flaxman.	"	Flaxman.
72	Landscape; Livermore Falls, Plymouth, N. H.*	"	G. L. Brown.
73	Landscape; Medford Salt Marshes.*	"	G. L. Brown.

No.		Contributor.	Artist.
74	Four photographs; Landscapes from Turner's Liber Studiorum.	G. L. Chandler.	Ira W. Turner.
75	Crevasse on the Mer de Glace; Chromo-lithograph.	"	G. L. Chandler.
76	Head of Daniel Webster; a photograph from a relief in marble, life size.	"	
77	The Prophet Zachariah; carbon photograph, from the fresco by M. Angelo.	"	
78	Italian Shepherd.*	Mr. Newcomb.	George Newcomb.
79	View in Conway, N. H., near Artists' Mill.*	"	George Newcomb.
80	Kiarsarge Brook, Conway.*	"	George Newcomb.
81	Artists' Brook, Conway.*	"	George Newcomb.
82	Moonrise and Sunset, White Head Harbor, Portland.	E. S. Morse.	H. B. Brown.
83	Out-door Sketch, Campton, N. H.	"	H. B. Brown.
84	Palette Knife Sketch.	"	H. B. Brown.
85	American Bittern; Pastel from Still Life.	Mrs. Osgood.	Mrs. G. P. Osgood.
86	Woodcock from Still Life.	"	Mrs. G. P. Osgood.
87	Water Color, Autumn Leaf and Maidenhair.		Miss L. H. Cleveland
88	Water Color, Autumn Leaves.		Miss L. H. Cleveland
89	Lake Lucerne.		Helen Philbrick.
90	Autumn Scene.		Helen Philbrick.
91	Water Color.		Eliza Philbrick.
92	Sketch in Oil.	Chas. T. Jenkins.	G. W. Alston Jenkins
93	Clytie. Charcoal.	Miss Callier.	Miss Ida Callier.
94	Copy from Photograph, Charcoal.	"	Miss Ida Callier.
95	Head—original.	"	Miss Ida Callier.
96	Child's Head. Charcoal.	"	Miss Ida Callier.
97	Eastern Beauty, Charcoal.	"	Miss Ida Callier.
98	Fruit Piece.	Mrs. Metcalf.	Mrs. E. S. Metcalf.
99	Lamb bound for Slaughter.	"	Mrs. E. S. Metcalf.
100	Italian Doves.	"	Mrs. E. S. Metcalf.
101	La Cucultrice.	"	Mrs. E. S. Metcalf.
102	Landscape.	Mrs. J. S. Cabot.	Gifford.
103	Portrait of Danish Prince, Copy.	"	Miss M. E. Williams
104	Grapes.	"	Mrs. R. H. Lathrop.
105	Table Top.	Mrs. Kemble.	Mrs. E. T. Kemble.
106	Table Top.	"	Mrs. E. T. Kemble.
107	Table Top.	"	Mrs. E. T. Kemble.
108	Tile.	"	Mrs. E. T. Kemble.
109	Tile.	"	Mrs. E. T. Kemble.
110	Derby Mansion.	E. S. Morse.	E. S. Morse.
111	The Lookout.	"	E. S. Morse.
112	Norman's Woe near Gloucester, Mass. Scene of the Wreck of the Hesperus.*	Mrs. Kindler.	Mrs. A. M. Kindler.
113	Study of Cattle.*	"	Mrs. A. M. Kindler.
114	Eastern Point.	"	Mrs. A. M. Kindler.
115	Marine View.*	"	Mrs. A. M. Kindler.
116	Full Military Record of Gen. U. S. Grant executed on the Principle of Reynold's Escutcheon of Military Service.	J. P. Reynolds.	R. L. Brown.
117	Military Record.	"	R. L. Brown.
118	Military Record.	"	R. L. Brown.
119	Shadow Dance.	Miss Callier.	Miss Ida Callier.
120	Terrier.	"	Miss Alice Callier.
121	Pen and Ink Composition.	George Flint.	George M. White.
122	Peace.	John Robinson.	
123	Pond Lilies.	"	Miss Mary A. Clark.
124	House Seven Gables.	"	George M. White.

No.		Contributor.	Artist.
125	Copy of Portrait of Raphael (purchased at Florence).	A. J. Archer.	Abel Nichols.
126	Castle of St. Angelo.	Elijah W. Upton.	Joseph Ames.
127	Fancy Head.	"	
128	Landscape, Head Waters of the Saco River.	"	Champney.
129	Off Cape Race.	W. D. Northend.	S. G. W. Benjamin.
130	Fairy Tales.	"	Miss H. F. Osborne.
131	Dominican Nun.	"	T. T. Spear.
132	Sherwood Oaks; English Water Color Chromo.	John Robinson.	
133	Bridge at Bassée.	N. Hopes.	Dufresne.
134	John Brown.	A. G. Browne.	T. S. Noble.
135	Crayon from Model.	Mr. Whitney.	Charles F. Whitney.
136	The Winnower.	Miss Johnson.	Miss Kate Johnson.
137	Fuchsia on Rice Paper.	Miss M. E. Briggs.	Miss Kate Johnson.
138	Painted Cup.	Miss Johnson.	Miss Kate Johnson.
139	Wistaria.	"	Miss Kate Johnson.
140	Sketch.	M. G. Wheatland.	Gay.
141	Water Color.	"	L. E. Merrill.
142	Water Color.	"	Rebecca Munroe.
143	View on the Hudson.	"	Miss Forrester.
144	Portland Harbor from Cushing's Island.	"	
145	Motto in Water Colors.	Mr. Dodge.	Miss E. Gardner.
146	Violets.	Miss Johnson.	William B. Dodge.
147	Water Color.	Miss Quimby.	Miss Kate Johnson.
148	Charcoal Sketch near Readville.	Miss Smith.	Miss A. M. Quimby.
149	Copy from an Oil Painting.	"	Miss S. E. Smith.
150	The Monk, after Hunt.	"	Miss S. E. Smith.
151	Pine Grove, Blue Hill.	"	Miss S. E. Smith.
152	Copy of Head by Hunt.	"	Miss S. E. Smith.
153	Italian Boy.		Miss S. E. Smith.
154	Oak Bluff, Water Color.	Miss Kimball.	Miss S. S. Kimball.
155	Bird and Nest.	"	Miss S. S. Kimball.
156	Medallion; Europe; photograph.	Geo. R. Chapman.	
157	Medallion; Asia; photograph.	"	
158	Medallion; Africa; photograph.	"	
159	Medallion; America; photograph.	"	
160	Sunset.	E. S. Atwood.	Loemons.
161	The Mountain Brook.	"	
162	Cape Elizabeth.	Mrs. F. H. Lee.	Miss M. T. Hersey.
163	Lucrece.	O. P. Lord.	Goodman.
164	Artists' Reunion.	"	Hamman.
165	Socrates instructing Alcibiades.	"	Schopin.
166	Lily, charcoal copy.	Miss Peirson.	Pupil of S. E. Smith.
167	Hand from a cast.	"	" S. E. Smith.
168	Grapes from cast.	Miss Osgood.	" Miss Williams.
169	Japan Lily, Charcoal.	Miss Smith.	Miss S. E. Smith.
170	Currants.	T. F. Hunt.	George M. White.
171	Autumn.	"	S. G. W. Benjamin.
172	Early Morning at Sea.	"	J. J. Enneking.
173	Path in the Woods.	"	Italian.
174	Fruit.	"	George M. White.
175	Gorge near Stowe, Vt.	W. D. Northend.	Landseer.
176	Wild Cattle, Engraving.	Miss Callier.	Miss Alice Callier.
177	Panel; Apple Blossom.	"	Miss A. Callier.
178	Panel; Lilac.	"	Miss A. Callier.
179	Panel; Wild Rose.	"	Miss A. Callier.
180	Panel; Violets.	"	Miss A. Callier.
181	Panel; Golden Rod.	"	Miss A. Callier.
182	Blue Gentian, Water Color.	Miss H. Putnam.	Miss H. G. Carlton.
183	Thistle Piece, " "	Miss Grant.	Miss C. L. Grant.
184	Table Top. Pen and Ink.	Mrs. Davis.	Mrs. H. H. Davis.
185	Panel.	Mrs. G. Z. Silsbee.	Miss Silsbee.
186	Panel.	"	Miss Silsbee.

No.		Contributor.	Artist.
187	Nath'l Hawthorne at age of 36.	R. C. Manning.	Charles Osgood.
188	Portrait.	"	E. L. Custer.
189	Afternoon on L. Wallansee, Switzer'd.	"	E. L. Custer.
190	Cascade, Franconia.	"	S. P. Hodgdon.
191	Fruit.	"	
192	Study, Landscape.		E. L. Custer.
193	Horse, Pencil Drawing.		Benj. Henderson.
194	Portland Light.	E. C. Bolles.	H. B. Browne.
195	Flower Piece.		A. E. Whitmore.
196	Flower Piece.		A. E. Whitmore.
197	Sketch in Conway.	C. H. Weston.	George Newcomb.
198	A Study.	Miss K. Brooks.	Miss Kitty Brooks.
199	View in South Salem.	Miss K. Pierson.	Miss C. C. Lawrence.
200	Seven Pen Sketches.	Miss Saltonstall.	
201	Portrait, painted 1790.	Gardner Barton.	
202	Head of a Horse, after Landseer.	Mrs. Merritt.	Mrs. E. S. Merritt.
203	Roman Boy (copy after W. M. Hunt).	Miss Smith.	Miss S. E. Smith.
204	Italian Boy, a study from life.	"	Miss S. E. Smith.
205	Motto, Water Color.	"	Miss Dunning.
206	Baby (copy after W. M. Hunt).	"	Miss Smith.
207	Rainbow Creek, Florida (copy after Hunt).	"	
208	Pansies.	"	Miss S. E. Smith.
209	Red Rose.		Miss S. E. Smith.
210	Flower Panel.		Miss S. E. Smith.
211	Flower Panel.		Miss S. E. Smith.
212	Flower Panel.		Miss S. E. Smith.
213	Flower Panel.		Miss S. E. Smith.
214	Fruit.		S. E. C. Oliver.
215	Ship Rock.	C. Cooke.	George M. White.
216	Study.	"	George M. White.
217	White Mountains.	J. A. Gillis.	Gerry.
218	Winter Landscape.	Miss H. H. Silsbee.	Miss E. Gardner.
219	Engraving, Sistine Madonna.	B. H. Silsbee.	
220	Engraving, The descent from the Cross.	"	
221	Engraving, St. Michael slaying the Dragon.	"	
222	Engraving, Christ bearing the Cross.	"	
223	Valley of the Pemigewasset.	"	S. L. Gerry.
224	Copy of Madonna by Murillo.	"	
225	Engraving, Marriage of St. Catherine.	"	
226	Ferns, etc.		Lucy E. Merrill.
227	Water Color, Cat o' Nine Tail.		Helen F. Ayres.
228	Pink Splashes, Hardhack.		Helen F. Ayres.
229	Water Color, Flower piece.		Ellen Robbins.
230	Flower Piece.		Ellen Robbins.
231	Convolvulus.		Ellen Robbins.
232	Gladioli.		Ellen Robbins.
233	Winter Scene.		M. Macpherson.
234	Landscape.		M. Macpherson.
235	Loon.		M. Macpherson.
236	Echo Lake.		J. W. Averill.
237	Group of Cattle.		J. W. Averill.
238	Fruit Piece.	I. Fellows.	Miss S. E. Fellows.
239	Landscape.*	Miss Perkins.	Miss Annie Perkins.
240	Water Color.*		Miss Annie Perkins.
241	Water Color.	I. Fellows.	Miss S. E. Fellows.
242	Ezekiel.	Mrs. Nourse.	
243	Joel.	"	
244	Spanish Lady.		
245	Panel in Oil.	E. W. Upton.	Miss J. A. Stetson.
246	Shylock and Jessica.	"	Ames.
247	Feeding Chickens.		Miss H. F. Osborne.
248	Panel, Pansies.		Miss H. F. Osborne.

<i>No.</i>		<i>Contributor.</i>	<i>Artist.</i>
249	Poet's Dream.	C. A. Ropes.	Alex. Vion.
250	Canadian Winter.	"	Creighoff.
251	Kitchen and chicken.	"	Conterier.
252	Dessert.	"	X. L. Marsh.
253	The Dumb Donkey.	"	Lalaise.
254	The First Ride.	"	Lalaise.
255	Madonna.	"	Shraeder.
256	The Transfiguration.	"	S. B. Waugh.
257	Resignation.	"	Unknown.
258	Eastern Point.	"	Lane.
259	English Inn.	"	D. F. Notermay.
260	Barn Yard.	"	
261	Sir Galahad's Guest, from Tennyson's "Holy Grail."	Miss Osborne.	Miss H. F. Osborne.
262	Portrait of Daniel Webster, a relieve in marble.*	Mr. Chandler.	G. L. Chandler.
263	Portrait of Washington.	Mr. Southward.	George Southward.
264	Marine View.	"	George Southward.
265	George Washington.	E. W. Upton.	J. Ames.
266	Fruit Piece.	Miss Pratt.	Miss Pratt.
267	Fruit Piece.	"	Miss Pratt.
268	Rev. Dr. Cutler's Barn, Hamilton, Ms.	F. Lamson.	H. S. Fiske.
269	View Belknap. N. H.	"	H. S. Fiske.
270	Lamson's Bridge, Topsfield.	"	C. C. Marcy.
271	Cymbeline, Water Color.	W. H. Foster.	H. L. Burchmore.
272	Interior.	"	Unknown.
273	Interior.	"	Unknown.
274	Fruit Piece.	Miss Saltonstall.	John Sutton.
275	Lynnfield Pond.	"	R. D. Wilkie.
276	Copy and Design, Breast-plate and War Mantle. Minerva.	Miss Carlton.	Miss H. E. Carlton.
277	Flowers from Nature.	D. B. Hagar.	Miss H. E. Carlton.
278	Table Top, Roman Mosaic.	Mrs. J. O. Safford.	
279	Fancy Carved Ink Stand.	Willie Safford.	
280	Marine View.	Mrs. John N. Mott.	Dr. Ruggles.
281	Roses.	"	Miss Studberg.
282	Venice, Moonlight.	"	
283	Venice, Moonlight.	"	
284	Water Fall.	Mrs. G. H. Wood.	Griggs.
285	Early Autumn.*	Mrs. Kindler.	Mrs. Kindler.
286	A Sibyl; copy from Guercino.	Mrs. J. H. Silabee.	
287	Rabbits, copy.	Miss Grant.	Miss Lydia Grant.
288	Lion, copy, charcoal.	Miss Pickering.	Miss Pickering.
289	Azalia and Vase.	"	Miss Alice Brown.
290	Cupid from Cast, charcoal.	Miss Brown.	Miss Alice Brown.
291	Winter Scene, copy.	Miss Nichols.	C. F. A. Nichols.
292	Flowers, copy.	"	C. F. A. Nichols.
293	Spools, from object.	Miss Oliver.	Miss Lizzie Oliver.
294	Venetian Scene.	J. M. Caller.	Defaux.
295	Church and Piazza of St. Peter's at Rome.	Miss Williams.	Moretti.
296	View on the Tiber near Rome.	Geo. R. Emmerton.	J. M. Emmerton.
297	Monastery in Gottenberg.	J. M. Caller.	Defaux.
298	Artist's Brook, North Conway.	Daniel Low.	George Newcomb.
299	Panel.	Mrs. F. C. Butman.	Miss Butman.
300	Apple Blossom.	"	Miss Butman.
301	Original painting of Cleopatra, by Guido.	Miss E. Gardner.	Guido.
302	Terrier Study.	Miss Agge.	Miss A. Agge.
303	Abd El Kadir, from Bronze.	"	Miss Agge.
304	Contentment, water color.	Miss Brown.	C. P. Brown.
305	The Little Foxes.	W. D. Northend.	Carter.
306	Autumn Leaves.	Miss Allen.	Miss Allen.
307	Naugus Head.	Prof. A. S. Packard	Mrs. Hyatt.
308	Portraits.	J. Peirce.	Charles Osgood.
309	Water Color.		Miss A. M. Quimby.

No.		Contributor.	Artist.
310	Photograph of bust of Wendell Phillips.	A. G. Brown.	
311	Water color, Roses.		Pupil of S. E. Smith.
312	Painting, Rose.		Pupil of S. E. Smith.
313	Sepia Tree Study.		Pupil of S. E. Smith.
314	Head of an Armenian Priest.		Miss M. E. Williams.
315	Head of a Pilgrim.		Miss M. E. Williams.
316	Copy of picture in Boston Athenaeum.		Miss M. E. Williams.
317	Picture wrought on silk with chenille and floss.	Mrs. F. C. Butman.	Lucy Ropes. 1819.
318	Glaze Portraits.		J.W. & J. S. Moulton.
319	Albumen Portraits.		J.W. & J. S. Moulton.
320	Albumen Portraits.		J.W. & J. S. Moulton.
321	Spring Flowers.	Mrs. E. Putnam.	Miss E. Gardner.
322	Portrait.	Alfred Peabody.	Mrs. Wayland Hoyt.
323	Portrait.	"	Mrs. Wayland Hoyt.
324	Intervale at North Conway.	Miss Gardner.	Miss E. Gardner.
325	Winter's Farewell. This is for sale for the benefit of the Salem Hospital.*	"	
326	Island of Pico.	A. H. Johnson.	Miss E. Gardner.
327	English Channel.	"	G. W. S. Benjamin.
328	Apple Blossoms.	J. M. Callier.	G. W. S. Benjamin.
329	Roses.	"	Miss Alice Callier.
330	Charcoal Sketches.	"	Miss Alice Callier.
331	Prayer in the Desert.	C. A. Ropes.	Miss Ida Callier.
332	Portrait, Cromwell.	A. G. Brown.	Pupil of Vernet.
333	Landscape.	C. H. Higbee.	
334	Flowers.	Miss Gardner.	E. Burrill, jr.
335	Cattle.	W. P. Upham.	Mrs. Gardner.
336	Landscape.	Geo. Newcomb.	O. W. H. Upham.
337	Water Color.	Miss M. Allen.	Geo. Newcomb.
338	Landscape.	H. Kilburn.	Miss M. Allen.
339	Landscape.	"	H. Kilburn.
340	M. Angelo; engraving.	C. H. Higbee.	H. Kilburn.

Pictures marked thus* were for sale. The exhibition was continued from Thursday, March 11, to Friday evening, March 19.

REGULAR MEETING, MONDAY, MARCH 22, 1875.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records of preceding meeting read.

Mr. J. H. STEVENS delivered an interesting lecture upon a subject with which he has become pretty thoroughly acquainted by long and patient study.

He commenced by stating that he should treat experimen-

tally the applications of galvanic electricity to a few of the arts of every day life. Electricity, he said, is one of the more newly developed of the wonderful and beautiful forces that nature offers with a lavish hand, and in this great awakening on scientific subjects, the efforts to invade the penetralia of her domain have been amply rewarded by the glorious revelations she has vouchsafed of the operations carried on in the mysterious depths of her aerial and subterranean laboratories.

Electricity, though long known, has always been, and is now, very imperfectly understood. It is true it can be liberated from its elemental prison house, measured and sent laden with intelligence to the uttermost parts of the earth in a moment of time, but should the question be raised, "What is electricity?" the lecturer said that he for one should have to say, he did not know. It is simply known that it is one of the most powerful of the natural forces, but the intensity which can carry it, upon a free conductor, entirely around the circumference of the earth four times in one second is utterly beyond comprehension.

It is customary to speak of it as a fluid, and talk of a current of electricity flowing through a wire. But that cannot be, for certainly a fluid and a solid cannot occupy the same space at the same time. However, that is a convenient way of speaking, and to call it a current also hides our ignorance on the subject. As one of the natural forces it is of very vital importance in every day life. It pervades all things. The air we breathe is vitalized by its presence. The food we eat is rendered palatable and nutritious by its power. It attends the rising and the setting of the sun, and the midday solar heat causes a surging of vast electric and magnetic forces, which exert a powerful influence in the great economy of nature.

The methods of developing electricity in considerable

quantities for practical use are abundant. As the time for experiments was necessarily short, the lecturer proceeded at once with them. He took, at first, one of the simplest methods of developing a galvanic current. He said this is done most effectually by subjecting to an acid solution two metals of an entirely opposite nature, one of which shall be most easily oxidized by the acid, and the other not oxidized at all. The easily oxidized or positive metal is commercial zinc; the other or negative metal is pure platinum, the most refractory and valuable of metals to the chemist and the electrician. If the two metals were alike, they would be acted upon equally, thus offering no inducement for a transfer of force from one to the other, and consequently no electrical action.

The lecturer then placed the metals in a glass of water, slightly acidulated with sulphuric acid. The zinc plate was amalgamated with mercury, so that no local action should take place until the condition required for a transfer of the tension or electro motive force from one plate to the other was fulfilled. That condition is to place a metallic connection from one plate to the other, outside of the solution, as a conductor for the current to travel upon. This was done with a piece of copper wire. The current then was flowing rapidly along the wire, from the platinum to the zinc plate. Through the solution it was flowing from the zinc to the platinum. The water was decomposing, the oxygen evolving at the zinc plate and the hydrogen at the platinum. The sulphur attacking the zinc was precipitated in the form of crystallized sulphate of zinc.

The wire conductor may be one inch long or one thousand miles long, and the electric force will be felt equally along its whole length, the strength of battery being equal to the resistance of the wire. Now to utilize this

current of electricity for a motive power, it must be converted into magnetism, which is easily done by wrapping insulated copper wire, in many turns, around soft iron of any convenient shape.

One of the many practical uses of the electric current he explained by the use of apparatus which was put up in a circuit about the hall. It represented a circuit of street gas-lights, such as have been in use in Ward Three in this city since last fall, and though the winter has been an unusually severe one, they have proved themselves equal to it, and have worked with perfect success through the severest storms. The apparatus consisted substantially of an electro magnet, an armature, ratchet wheel and pawl. Two wires led from the battery at the central station to the first light in the circuit, and thence to each one in its turn. When a current was sent out on the lighting wire, the magnet was charged, the armature of which actuates the pawl and ratchet wheel, thus opening the cock to let on the gas, at the same time, by an interruption of the current at the tip, lighting the gas. At the expiration of the half second of time which it takes to turn on and light the gas, the current was sent forward, by the action of a cam and spring, to the next light, and so on to the end of the circuit. A reversal of the switch at head quarters sent out a current on the other wire, which by a similar operation turned off the gas at the rate of four burners in one second.

After explaining the apparatus very fully and minutely, in its capacity as a burglar alarm, etc., the lecturer passed on to the consideration of some other branches of electrical science. The subject of ocean telegraphy was taken up and treated as fully as the time would permit, by the use of actual working apparatus and diagrams.

After speaking of the importance of international tele-

graphic communication, in a political and commercial light, the lecturer introduced some very delicate receiving apparatus, to show the great difference between ocean and land telegraphy. He explained that instead of the noise, glare of light, clicking and bustle of an ordinary telegraph office, the cable office was silent and dark, to enable the watchful operator to detect the slight deflection of the tiny pencil of light which was to impart to him the intelligence which had flashed along under a thousand watery leagues from a distant part of the world. After explaining the reversing key and the different methods of working cables, by reversal and change of potential, the lecturer explained by diagrams some of the methods of locating a fault or a break a hundred or a thousand miles away from the shore, down deep upon the bottom of the ocean; also how a steamer would go almost directly over the spot, find, take up and repair the fault. Several specimens of cables were exhibited.

A very sensitive tangent galvanometer with a small reflector within its coils was arranged to receive a small ray of light coming from a lamp, through a small hole in the side of a box. On the back of the reflector was fastened a very small magnetic needle, which was deflected to the right or left in obedience to the positive or negative current sent through the wire by the reversing key at the sending station. The ray of light from the darkened box falling upon the reflector through a convex lens, was reflected upon a screen at the top of the box.

A positive current through the galvanometer would throw the little spot of light to the right of zero on the screen. A negative current would throw it to the left, thus producing the combination, which to the practised eye formed the letters of the alphabet.

The lecturer then gave an illustration of the very delicate and difficult process of finding a break or fault in the

cable in mid-ocean. For instance, a very slight abrasion occurs in the insulation of the conductor at some point in the ocean. It is just sufficient to allow enough of the current to escape to prevent intelligent communication. The test is made by disconnecting both ends of the cable from all apparatus. A test battery and sensitive galvanometer are then applied to one end, and the resistance in OHMS of that portion is obtained, which is the resistance of the conductor to the fault, plus the resistance of the fault itself to the earth. Then the same process is repeated from the other end.

The resistance of the fault itself must be eliminated from both tests, and as it will be the same in both cases, the process will be as follows :

To the known resistance of the whole cable add the obtained resistance of one test, deduct from that the obtained resistance of the other test, divide that result by two and you have the resistance of the conductor in the first test from the office to the fault, in OHMS, which is easily reduced to miles and fractions of a mile.

The chart then gives its locality in the ocean. A steamer then goes as near to the spot as possible and drags for the cable until it is fished up. By cutting the cable it is easily ascertained which side of the steamer the fault lies.

The cable is then picked up by machinery and passed along across the deck as the steamer proceeds. By passing it through a tank of water connected by very delicate test apparatus to the sea, the fault announces itself the moment it reaches the tank of water on deck. It is then cut out. Communication is established with both sides of the ocean, the cable is joined, the insulation is completed, and it is dropped down into its bed of infusoria, to throb again with those mysterious international impulses.

The finding of a break in the cable is similar in some respects, he said, to the process just described.

The lecturer then explained by diagrams the duplex or double transmission system, where two messages are sent at the same time in opposite directions upon the same wire without interference.

The lecture was closed by a series of brilliant experiments in electro-magnetism, the electric light, the deflagration of metals by the electric current, and the explosion of electric torpedoes.



REGULAR MEETING, MONDAY, APRIL 5, 1875.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence :—

From George H. Allen, Boston, March 2, 22; Samuel L. Boardman, Augusta, Me., March 17; John M. Bradbury, Ipswich, March 1; Waldo Higginson, Boston, March 2; Frank M. Caryl, Franklin, N. J., March 22; A. P. Mayer, Hoboken, N. J., March 1; George B. Gavett, Boston, March 10; Rufus King, New York, March 24; C. F. Maynard, Newtonville, March 5; Thomas E. Proctor, Boston, March 4; R. Ridgway, Washington, D. C., March 21, 29; Smith & Co., Woburn, April 1; Bristol Naturalist Society, Feb. 28; Liverpool Literary and Philosophical Society, Jan. ; Rhode Island Historical Society, March 9; Buffalo Historical Society, March 24; Iowa State Historical Society, March 30; Maryland Historical Society, March 28; New York Historical Society, March 28; Wein, K. Akademie der Wissenschaften, Mun 9, 16; Worcester, Public Library, March 24.

The LIBRARIAN reported the following additions to the library :—

By Donation.

KELLEY, JAMES H. *Essex Register* for 1828, 1830. 1 vol. folio.
MACKENZIE, S. S., of Topsfield. Miscellaneous pamphlets, 15.
MASS. HORTICULTURAL SOCIETY. *Transactions of*. 1874, pt II.
MERCANTILE LIBRARY ASSOCIATION OF SAN FRANCISCO. *Twenty-Second Annual Report*. 1874.

MERCANTILE LIBRARY COMPANY OF PHILA. Fifty-Second Annual Report. Jan., 1875.

OFFICE OF THE CHIEF OF ENGINEERS. Report in reference to the Canal to connect the Chesapeake and Ohio Canal with the City of Baltimore, by Col. J. J. Abert. 1838. 4to pamph. Preliminary Report upon Invertebrate Fossils collected by the Expeditions of 1871, 1872, 1873, by C. A. White. 8vo. 1874. Progress Report upon Geographical and Geological Explorations and Surveys west of the 100th meridian.

PERRY, W. S., of Geneva, N. Y. Miscellaneous pamphlets, 25.

PHIPPEN, GEO. D. Josephus. 1 vol. 4to. Scientific American, 1862. 2 vols. folio. History of Provençan Poetry. 1 vol. 8vo. Life of A. Lincoln in German. 1 vol. 8vo. Mechanics' Magazine. 4 vols. 8vo. Harmer's Observations. 4 vols. 8vo. Lisle's Husbandry, 1757. 1 vol. 8vo. Greek and English Dictionary. 1 vol. 8vo. Kempton's History. 4 vols. 8vo. Antiquities of Rome. 1 vol. 8vo. The Modern Jesuits. 1 vol. 8vo. American Atlas. 1 vol. folio. Log Books, 4. Miscellaneous pamphlets, 150.

U. S. NAVAL OBSERVATORY. Washington Astronomical and Meteorological Observations, 1872. 1 vol. 4to.

U. S. PATENT OFFICE. Official Gazette, Jan. 26, Feb. 2, 9, March 9, 16, 1875.

WOODMAN, CYRUS, of Cambridge, Mass. Buxton Centennial, 1772-1872. By J. M. Marshall. 1 vol. 8vo.

By Exchange.

ST. LOUIS ACADEMY OF SCIENCE. Transactions. Vol. III. No. II. 8vo. 1875.

AMERICAN GEOGRAPHICAL SOCIETY. Journal. Vol. IV, 1873. 1 vol. 8vo.

BRISTOL NATURALIST SOCIETY. Proceedings of. Vol. I, pt. 1. New Series. 1874. 8vo.

GEOLOGICAL SURVEY OF CANADA. Report of Progress for 1873-4. 8vo.

N. E. HISTORIO-GENEALOGICAL SOCIETY. Register for April, 1875.

NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Genealogical and Biographical Record. April, 1875.

PEABODY INSTITUTE, Peabody, Mass. Twenty-Second Annual Report of the Trustees.

PHILA. ACADEMY OF NATURAL SCIENCES. Proceedings. Pt. III, Oct., Nov., Dec., 1874.

PUBLISHERS. American Journal of Education. American Naturalist. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Salem Observer. Salem Post.

Among the donations announced were a collection of glass ware made at the works of, and donated by, the Boston and Sandwich Glass Company, through Mr. John C. Lee, of Salem, illustrative of glass manufacture.

Horace Brown, Oliver D. Way and Daniel C. Manning, of Salem, and George W. Grader, of Marblehead, were elected resident members.

Rev. E. C. BOLLES presented to the Institute about seventy-five examples of East Indian and Japanese paper, the former obtained in London through the kindness of M. C. Cooke, Esq., and the latter derived from exchange with the Agricultural Department at Washington. After speaking of the ancient paper made by expanding sections of the cellular tissues of plants, as the papyrus of the Egyptians and the rice paper of the Chinese, Mr. Bolles called attention to the fact that the Japanese paper exhibited to the Institute was made from the bark of the Paper Mulberry (*Broussonetia papyrifera*), the same substance which, beaten out without pulping, forms the Tappa cloth of the Sandwich Islanders. One remarkable thing about the series of paper presented was its range of texture and weight; as the examples exhibited the most delicate and beautiful tracing paper, the coarsest "board," and most of the intermediate grades. Many specimens, especially those used for book-binding and box-covering, were profusely and artistically ornamented in color. A very fine and gauzy paper was shown as the goldsmiths' substitute for cotton. Perhaps the most curious was the vegetable leather, not to be distinguished in weight, color or flexibility from the best morocco for binders' use. A description of the manufacture of this may be found in the "Journal of the Franklin Institute" for January, 1875.

The East Indian paper was manufactured from a greater variety of substances. Some from Cashmere was from waste silk and examples from Berar from bamboo. A very delicate, highly colored and tough paper was the "kite paper" of Oude. Accompanying this series were the bark of *Broussonetia papyrifera* and *Daphne cannabina*, with the pulps made from both.

It is understood that these series are only in commence-

ment of a cabinet illustrating paper-making of all countries and ages, to which the Institute solicits contributions.

Mr. Bolles, when in England, procured a large number of specimens of vegetable fibres, which have been handsomely mounted, and will be properly arranged for exhibition, in the new department of Technology, which has been organized by the Institute, and which cannot fail to prove both interesting and instructive. He also obtained, through the courtesy of M. C. Cooke, Esq., a variety of models in clay, showing the different classes of workmen engaged in the various processes of paper manufacture as practised in India. Specimens of each were shown to the audience.

Mr. F. W. PUTNAM called attention to the fact that very similar materials (the inner bark of trees, leaves of rushes, etc.), described by Mr. Bolles as used by the ancient races of the East for the manufacture of paper, were also used by the prehistoric races of this country for the purpose of making garments, as proved by the specimens which he had exhibited at a former meeting.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 7.

SALEM, MASS., MAY, 1875.

No. 5.

One Dollar a Year in Advance. Ten Cents a Single Copy.

SYNONYMY, DESCRIPTION, HISTORY, DISTRIBUTION AND HABITS OF THE PRAIRIE HARE (*LEPUS CAMPESTRIS*).

BY DR. ELLIOTT COUES, U. S. A.

Synonymy.

Lepus virginianus var.?, HARL., Fn. Amer. 1835, 310 (based entirely on the "Varying Hare of LEWIS and CLARK," *infra*; description from these authors).

Lepus virginianus ["HARL."], RICH., F. B. A. i, 1839, 224 (Saskatchewan; N. to 55°. Not of HARLAN, *op. cit.* 196, which is *L. americanus*).—MAXIM., Reise, i, 1839, 508.

Lepus campestris, BACH., J. A. N. S. P. vii, pt. ii, 1837, 349; viii, pt. i, 1839, 80 (in white pelage). WATERH., N. H. Mamm. ii, 1848, 127. GIEB., Säugeth. 1855, 449. BD., M. N. A. 1857, 585. NEWB., P. R. R. Rep. vi, 1857, 63 (upper California and Oregon). COOP. and SUCKL., N. H. W. T. 1860, pp. 104, 131 (Columbia to the Missouri). HAYD., Tr. Am. Phil. Soc. xii, 1862, 149 (upper Missouri). MAXIM., Arch. f. Naturg. xviii, 1862, ; Verz. N.-A. Säug. 1862, 193. ALLEN, Bull. Ess. Inst. vi, 1874, pp. 52, 53, 61, 66 (Kansas, Colorado, Wyoming and Utah). AMES, Bull. Minn. Acad. Nat. Sci. 1874, 70 (Minnesota).

Lepus townsendii, BACH., J. A. N. S. P. viii, pt. 1, 1839, 98, pl. 2 (Columbia R., in summer pelage). TOWNS., Narr. 1839, 325. AUD. and BACH., Q. N. A. i, 1849, 25, pl. 3. STEV., U. S. Geol. Surv. Terr. 1870, 462 (Wyoming).

Varying Hare, LEWIS and CLARK, ii, 179 (earliest identifiable account). HARL., *op. et l. c.* (Not of authors generally.)

Prairie Hare of the Fur Traders. RICH., *op. et l. c.*

Jackass Rabbit, VULG., in the regions it inhabits.

ESSEX INST. BULLETIN.

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Description (from various specimens collected by the writer in July and August, in Montana, lat. 49°).

With the general form of the other large, long-limbed, great-eared hares of the west. Ears, measured from extreme base, decidedly longer than head from nose to occiput. Tail vertebræ about as long as ears from their extreme base—longer than height of ear above its notch. Hind foot rather longer than ears or tail, about twice as long as fore foot from the wrist. Tail with its hairs longer than ear or foot. Width of ear, pressed flat, about one-half its height. Soles and palms densely hairy throughout, the pads reaching to the ends of the nails. Whiskers as long as the head, some black, others white. A few black bristles over the eyes, the lower series constituting true eyelashes. Edges of the eyelids naked. Muzzle completely clothed. Ears softly and closely furry both sides, excepting the deeper portions of the concavity, and with a long thin hairy fringe on the anterior folded over edge. General pelage extremely long, loose and fluffy.

General color of the upper parts pale dull yellowish gray, greatly predominating over a dusky brown with which it is mingled. The bases of the hairs are plumbeous-white, to which succeeds a dusky interval, the yellowish gray furnishing the tip. This predominant tone is pretty uniform, but there is an obscurely darker median dorsal area; while back of the ears, on the sides, hips, buttocks, and in fact all around the general dorsal area, the color lightens, by extinction of the dusky, into a pale plumbeous gray, with a faint yellowish gray tinge. The throat band is of this latter character, and so are the outer surfaces of the limbs for some distance. Toward the extremities, however, the limbs become more decidedly yellowish brown, slightly toned with dusky. The feet-pads are dirty brown, as if soiled by continued contact with the ground. The under side of the head, and, indeed, all the under parts excepting the throat band, are pure cottony white. The tail is pure white, too—a strong character of the species—the dark dorsal area which obtains in its allies being wholly wanting, or merely indicated by a slight plumbeous line, prolonged part way down the top of the tail. The crown of the head agrees with the upper parts in general, but owing to the closeness of the fur, the pattern is finer, and the darker annulations of the hairs gives a heavy ground upon which the yellowish tips of the hairs are more sharply displayed. This darker coronal area is enclosed between light transocular stripes, not well defined, but still showing plainly by contrast. The eyelids themselves are white. The extreme muzzle and the cheeks for a short distance, are light buffy brown, or pale fawn color, well contrasted against the pure white of the chin.

The ears are strongly particolored. The back of the ear is snow-white to within about an inch of the tip, where it is abruptly black. The very edge of the posterior border of the ear is snow white at base, but generally tinged with tawny in the rest of its extent. The broadly folded over anterior border of the ear, and the furriest part of the inside of the ear opposite are like the crown of the head, but the pattern is still finer. The anterior edge of the ear gives a delicate fawn-colored stripe all the way along, supplemented by a pure white fringe of longer hairs. The tip of the ear in front is black like the back, but this black tipping is of less extent than it is behind. The shortest pilous hairs of the concavity of the ear are white, tending to pale fawn color towards the end of the ear. Sometimes that portion of the concavity of the ear which is not covered by the fold of the anterior border shows a quite blackish area, only less conspicuous than the black tip.

The sexes of this species are not distinguished by any constant color-marks, nor have I been able to satisfy myself that there are any other than the purely sexual external characters, though the male may average rather the larger, longer-limbed and greater-eared. Nor are the young, from the time they are a few weeks old, materially different from the adults. The very young rabbits, however, have distinguishing color-marks. The dark portions of the hairs are extensive and intense; while the fur is so remarkably long, loose and straggling that this dark color is more apparent than it is in the adults. There are also some curious special head markings. The most conspicuous of these is a small pure white spot, exactly on the middle of the crown; which is usually accompanied by a white eye stripe, a white patch in front of the eyes, and white on the side of the nose. These markings are diffuse and irregular, but still quite noticeable; and the coronal spot persists usually until the animal is well grown. The foot-pads are white or whitish until they become gradually discolored by contact with the ground. The incisors are white. On comparing very young animals with individuals of the same size of the cotton tail of the region (the latter must be a week or so older to attain corresponding dimensions) the differences are very obvious. The larger species already displays the longer limbed and seemingly "looser-jointed" characteristics of its kind, in comparison with the close-set, chubby form of the smaller rabbit; the fur is very notably longer, looser and fluffier, without the smoothness and gloss of that of the other species; while the coloration is entirely mixed blackish and yellowish gray, without any of the rich ruddy tints of the limbs, breast and nape, which appear from the first in the smaller species. The black tips of the ears and their fawn colored margins are also characteristic.

Winter pelage. White, more or less mixed with gray underneath, and with rusty markings, especially on the legs and ears. The species probably never becomes entirely pure white, like *L. glacialis*.

MEASUREMENTS.

Couser's Number.	From tip of nose to				Tail to end of		Length of		Arm to end of claws.	Knee to end of claws.	Height of ear above notch.
	Eye.	Ear.	Occip.	Tail.	Verteb.	Hairs.	Fore ft.	Hind ft.			
4134 ¹	2.40	4.00	4.50	19.00	4.50	6.50	2.75	6.00	7.00	10.00	4.30
4200 ²	2.20	3.50	4.50	19.00	4.50	7.00	2.75	5.75	7.50	10.75	5.00
4269 ³	2.25	4.00	4.50	18.00	5.00	7.00	2.75	5.75	7.25	11.00	4.00

The written history of this species, though somewhat involved, may be fully elucidated. As in the cases of so many of our western animals, we owe our first recognizable account of this species to Lewis and Clark, whose description, though not entirely correct, is perfectly recognizable as belonging here. In 1825, Dr. Harlan copied their accounts in substance, querying the animal as a variety of his *L. virginianus* (the *L. americanus* of authors). In 1829, Sir John Richardson gave an accurate description, as far as his slight material went, supplemented with the account of Lewis and Clark, and from his whole article it is evident he had this species in view, although he miscalled it *L. virginianus*, supposing it to be the same as Harlan's animal, which it is not. The Prince Maximilian repeated Richardson's mistake of nomenclature; his account is otherwise accurate and unmistakable. In 1837, Dr. Bachman described it

¹ A fresh male specimen from near Milk River, July 5, 1874. Testes elongate, loosely pendulous, inguinal. Ear above occiput, 5.50. Eye grayish yellow. Humerus, 4.00. Femur, 5.00.

² A fresh female specimen from near Milk River, July 10, 1874. Ear above head, 6.00; width, pressed flat, 3.00.

³ A fresh female specimen from Three Buttes, Montana, Aug., 9, 1874. Ear above head, 5.00; width, 2.25.

in winter dress as *L. campestris*, the first tenable specific name. Shortly afterward, receiving it in summer dress, and being assured that it was not a "varying" hare, he redescribed it as *L. townsendii*. His subsequent suspicion, that his two names applied to the same animal in different vestures, as strongly expressed in the later work above quoted, has been amply verified. Since the rectified collation of synonymy by Prof. Baird in 1857, we find this well marked, abundant and widely distributed species noticed at greater or less length, and under its proper name, by nearly all the naturalists who have visited the northwestern or western territories, and reported the result of their observations. It may now be considered as a well known and thoroughly established species.

Its geographical distribution may be given with an undoubted close approximation to accuracy of detail. In British America, according to our chief if not only authority, Sir John Richardson, it has been traced north to 55°; "it is a common animal on the plains through which the north and south branches of the Saskatchewan flow, and which extend as far eastward as the Winepegoosis and southern extremity of Winepeg Lake." Along the northern border of the United States I have myself observed it from the beginning of the great plains just west of the Red River of the north, in eastern Dakota, to the base of the Rocky Mountains. It was most abundant in the region of the Upper Missouri and Milk River; but I have traced it in southeastern Dakota almost to the Iowa border. According to my observations it is the only jackass rabbit of Dakota and Montana. In Kansas, Mr. Allen states, "a few were seen in summer on the plains north of Fort Hays, and in winter from the western border of the state as far east as Bunker Hill Station." In this region they are associated with *L. callotis*. In Colo-

rado, the same author mentions that the species occurs in the parks, another species being there characteristic of the timbered mountainous region. Mr. Allen also found it "more or less common everywhere" in southwestern Wyoming, and extremely abundant in certain localities. To conclude with this gentleman's observations, he furthermore noted its common presence in the valley of the Salt Lake, Utah, where, as in Kansas, it is associated with *L. callotis*. So far as we have gone, we now see that the animal inhabits the prairie region of more than the northern half of the United States, from the eastern limit of the great plains westward. Our advices from west of the Rocky Mountains are equally explicit. Dr. Suckley reports it from the Blue Mountains of Oregon, and Mr. George Gibbs states that it is common on the plains of the Columbia east of the Cascades. In California, Dr. Newberry has indicated the limit of the range, at the point where the species is replaced by the ordinary "jack-ass" of that state, *L. californicus*. "The Prairie or Townsend's Hare is unknown in the valleys of California, though we found it a short distance south of the parallel of 42°, so that it may be said to inhabit that state. In the upper part of the Sacramento Valley, and even in the hills northeast of Fort Reading, we found the 'jackass rabbit' (*L. californicus*) everywhere abundant, the only hare, in the common acceptance of the term, known to exist there — *L. artemisiæ*, *audubonii* and *trowbridgii* being all called rabbits. Crossing the 'divide' between Lassen's butte, and coming down into the interior or Klamath basin, on the upper branches of Pitt River, we lost sight of the Californian species, to see no more of it till our return south months afterward. In its place another species * * * began to be occasionally seen, at first very rarely, afterwards oftener, as we approached the

Columbia, but never anywhere, in the region we visited, becoming so abundant as the Californian hare in some parts of its habitat. I saw the first individual of this species on the shores of Wright Lake." From this the limit of southward extension in California would seem to be more restricted than it is in the regions farther east. We have nothing to show that it occurs on the immediate Pacific slopes, and it probably does not. Nor did I ever ascertain its presence in New Mexico or Arizona, where *L. callotis* is found.

This, then, is the characteristic hare of the great plains—towards its southern limit associated with *L. callotis* and *L. californicus*, and on its mountainous confines meeting with the hare of the timber of those regions—but throughout vastly the greater portion of its range occupying the territory as the only representative of the several great hares of the west, all of which are known, wherever found, as "jackass rabbits," to distinguish them from the small species of the *L. sylvaticus* type. It is further notable as the only one of the very large long-limbed and great-eared group which, like *L. americanus*, regularly turns white in winter. The change probably occurs, in most cases, throughout the range of the species; in northern parts it appears to be universal; and, in fact, the only advices we have that it does not change are from Kansas, where, Mr. Allen states, that about half the specimens he secured in December and January retained their summer colors. There may, however, be some localities where the change is the exception rather than the rule. But even in the most northerly portions of its range, the change does not appear to be complete. There remains much bluish-gray about the roots of the hairs, and brown, rusty or yellowish tinges in places. The pale brown or fawn colored borders of the ears, and the similar colors

of the limbs towards their extremities, appear to be always retained. This is much as in *L. americanus*. The periods of the change are April and November.

In noting the habitat of the Prairie Hare, we must exclude from its range those portions which are wooded. Emphatically an animal of the plains, it never, so far as I have observed, enters timber, though ranging up to the very edge of the woods. Thus, we find it in the underbrush, sometimes quite heavy, of the river bottoms of the larger water courses in the west, but not in the woods that immediately fringe the rivers. It remains with us as we approach the timbered foot-hills of the Rocky Mountains, but we lose it in half a day's journey as we fairly enter the timber belt. It is as characteristic of the great sage barrens of the west as the sage cock itself; and in the more favored, grassy regions it is equally abundant. I have found it also in vast alkaline deserts I have traversed, and in those scarcely less forbidding tracts where a scanty herbage struggles with patches of prickly pear, mile after mile. In the more desolated regions, the only associate of its kind is the sage rabbit; near most of the water courses it will be found that the timber contains another ally, the common cottontail; but out on the broad rolling prairie, peculiarly its home, it flourishes almost alone.

Nor is the prairie hare in the least gregarious. I have never seen nor heard of several together, and indeed it is rare to find even two together, at any season whatever. It is one of the most solitary animals with which I have become acquainted. As we measure the weary miles of a day's march, a hare springs almost from beneath our feet, and another and another appears in succession, but always separated and independent of each other. I have never found any kind of locality even, which, presenting

special attractions, might invite many hares together. All places are alike to them; the oldest frontiersman, probably, could never guess with any degree of certainty where the next hare to bound off before him would appear. If it have any preference, however, it is for "weedy" tracts of which the sage brush regions furnish the best examples; there it finds shelter which the low, crisp, grass of rolling prairie does not afford, and also doubtless secures a greater variety of food. Like many other animals of the great plains, it appears independent of water; but we must judge this to be only an appearance.

In the regions where I have studied this hare, the female brings forth in June and early July—oftener the latter—and apparently only one litter is produced each season. The number of young is five or six, as a rule. The form is simply constructed, without burrowing, in the grass beneath some low, thick bush or tuft of weeds. The young are said to suckle and follow the mother for a month or more. They are agile little creatures, even when only a week or two old, and it is only when very young that they can be caught by hand. In travelling along the Milk River (where the species was abundant), early in July, I had several little ones brought to me, and some I kept for a time in a box. They had been stumbled upon as they dodged about in the grass, disturbed from their nest by the passage of our party. Though only five or six inches long, they had all the motions and attitudes characteristic of the parents, and made shift to run about quite cleverly. They could not eat, but some of them could be coaxed to lick a little milk. Their appearance, even at this early age, was unmistakable; the differences between them and young sage rabbits of the same size are elsewhere given. By the end of July we happened upon no prairie hares still so young as to be

taken in hand, though the third or half grown ones used often to stray about our camps, affording great amusement in the attempts instantly made by "all hands" to catch them.

I have not been eye-witness of the peculiar habits which doubtless mark the rutting period in this as in other species of the genus, having only been in the regions they inhabit later in the season. The period is over, I think, before June. Males taken during that month and the next are generally poor; the sexual organs are very apparent, as two long, linear masses in the inguinal region. After the care of the young, in July and August, the females are found much emaciated; and in fact, at no time during the summer, are these hares in good condition for the table. At other seasons the reverse may be considered the case by those who, unlike myself, are fond of rabbit-meat, the flesh, when in proper condition, being light colored, tender and not unpalatable. During the summer both sexes are terribly infested by a kind of tick, which fastens anywhere upon the body, but particularly about the ears, where I have found them almost in clusters. This tick appeared to me so different from any of those I had noticed on other rabbits, that I supposed it to be a new species, which I lately named *Ixodes leporis-campestris* ("Amer. Sportsm.," vol. iv, No. 22, Aug. 29, 1874). I regret that when I had the opportunity I did not make the necessary dissections, to see whether, like others of the genus, this species commonly harbors intestinal parasites. A tape-worm, *Tænia pectinata* Goeze (Diesing, Syst. Helminth. i, 498), is very frequent in *Lepus aquaticus*.

According to my experience, this hare is not much esteemed, either for its food or for its fur, by the whites of the region it inhabits, and it is accordingly not often an

object of pursuit. I have not known it to be trapped; the few I have seen killed, besides those I secured myself, were shot wantonly, to test skill with the rifle, or decide a trivial wager. In the country of buffalo, elk and antelope, such small game is little heeded, and its pursuit made an object of ridicule. It is not so easy, however, to shoot the animal, except by skilful marksmanship with the rifle; so timorous is it, that when startled it rarely stops within range of a shot-gun; while its always unexpected appearance, and the great bounds it gives as it makes off, render it a difficult mark, notwithstanding its size. Mr. Townsend has described a mode of netting it in numbers, pursued by Indians. "Some one or two hundred Indians, men, women and children, collect, and enclose a large space with a slight net about five feet wide, made of hemp; the net is kept in a vertical position by pointed sticks attached to it and driven into the ground. These sticks are placed about five or six feet apart, and at each one an Indian is stationed, with a short club in his hand. After these arrangements are completed, a large number of Indians enter the circle and beat the bushes in every direction. The frightened hares dart off toward the net, and in attempting to pass are knocked on the head and secured. Mr. Pambrun, the superintendent of Fort Wallawalla, from whom I obtained this account, says that he has often participated in this sport with the Indians, and has known several hundred to be thus taken in a day. When captured alive they do not scream like the common gray rabbit (*L. sylvaticus*)."

The extraordinary agility of this animal, which would be inferred from inspection of its lithe yet muscular and free-limbed shape, has always attracted attention. Lewis and Clark speak of its leaping eighteen to twenty-one

feet, and doubtless this is no exaggeration. Yet this is a matter shared by the allied species, and I do not think that the present surpasses *L. callotis* for example, in this respect. The two animals have always seemed to me alike in their powers of running and leaping. It is difficult to give one who has not seen the animals alive an idea of their singular appearance when at full speed, and the ground they get over in a few seconds is the more remarkable, considering the force they waste in unnecessary height of the leaps. The first sign one has usually of a hare which has squatted low in hopes of concealment, till its fears force it to fly, is a great bound into the air, with lengthened body and erect ears. The instant it touches the ground, it is up again, with a peculiar springy jerk, more like the rebounding of an elastic ball than the result of muscular exertion. It does not come fairly down, and gather itself for the next spring, but seems to hold its legs stiffly extended, to touch only its toes, and rebound by the force of its impact. The action is strikingly suggestive of the "bucking" of a mule, an affair with which people in the west are only too familiar. With a succession of these high jerky leaps the animal makes off generally in a straight course; there is nothing of the dodging and scuttling about that marks the running of the smaller rabbits. As it gains on its pursuers, and its fears subside, the springs grow weaker, just as a flat stone "skipped" on the water diminishes in length of the rebounds, and finally the animal squats in its tracks on its haunches with a jerk, to look and listen. If perfectly reassured, it may then lope on with easy steps, till it is out of sight, or it may squat low and disappear by folding back its ears behind some bunch of weeds. The ears, by the way, are curiously the most conspicuous part of the whole animal; few hares are seen, I fancy, as long as they keep those great

organs folded flat. But more than likely, on its first halt, the hare's natural timidity will not permit it either to squat to steal quietly away. On the contrary it sits erect on its haunches, intent to discover new alarm. The attitude at such times is highly characteristic. One fore foot is advanced a little before the other, and the ears are held pointing in opposite directions. A hare in such an attitude as this is always upon the watch, and the slightest stimulation of its fears at such time is enough to start it on its bounding course. It is a beautiful exhibition of timid watchfulness.

I have never seen this hare stand erect with its fore paws off the ground, as some of its smaller relatives are wont to do, and I doubt that it ever assumes this attitude except perhaps momentarily. The position above described, and the ordinary squatting in its form, are the only motionless attitudes I have observed. On the few occasions when I have seen it feeding quietly, unsuspecting of danger, it moved about with alternate lengthening and doubling of the body, like that of the common rabbit under similar circumstances.



REGULAR MEETING, MONDAY, APRIL 19, 1875.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair.

W. P. UPHAM was elected secretary, *pro tem*. Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From N. J. Bartlett, Boston, Apr. 9; W. H. Whitmore, Boston, Apr. 9, 17; Dr. J. Plason, Wien, Nov. 20, 1874; Daniel A. Rogers, Chicago, Ill., Apr. 9; Brunn,

Naturforschende Verein, Nov., 1874; Minnesota Historical Society, Apr. 3, 9; New Bedford Free Public Library, Apr. 2; Quebec Literary and Historical Society, Apr. 9; Smithsonian Institution, Dec. 30, 1874, Apr. 3; Vermont State Library, Apr. 10; Yale College, Corporation of, April 14.

The LIBRARIAN reported the following additions to the library :—

By Donation.

COLE, C. J. Registers and Programmes of the State Normal School in Salem, from 1856-1875. 73 pamphlets.

HUNTINGTON, A. L. Miscellaneous pamphlets, 6 vols. 8vo. Collection of the American Statistical Association, Vol. i. 1 vol. 8vo. Water Power of Maine. 1 vol. 8vo. Patent Office Reports, 1851, 1853, 1857, 1858, 1859. 5 vols. 8vo. Agriculture of Mass., by C. L. Flint. 3 vols. 8vo. Debates in Mass. Convention, 1853. 3 vols. 8vo. Message and Documents, 1852-3. 2 vols. 8vo. 1855-6. 1 vol. 8vo. History of the Reed Family. 1 vol. 8vo. Commerce and Navigation, 1850. 1 vol. 8vo. History of Lowell. 1 vol. 8vo. Græca Minora. 1 vol. 8vo.

KIMBALL, JAMES. Cape Ann Advertiser, Dec. 18, 1874, Feb. 12, 19, 26, March 5, 12, 19, 26, Apr. 2, 1875.

MERRITT, L. F. Essex County Mercury, Mch. 31, Apr. 7, 14, 1875. Salem City Document, 1874. 1 vol. 8vo.

TWNING, T., of Twickenham, England. Technical Training, by donor. 1 vol. 8vo. London, 1874.

U. S. BOARD OF EDUCATION. Report of the Commissioner, 1873. 1 vol. 8vo.

U. S. PATENT OFFICE. Official Gazette for March, 1875.

By Exchange.

AMERICAN ANTIQUARIAN SOCIETY. Proceedings of the, No. 63, 1874. 8vo.

CANADIAN INSTITUTE. Canadian Journal, Vol. xiv, No. iv, March, 1875. 8vo.

GESELLSCHAFT NATURFORSCHENDER FREUNDE, BERLIN. Sitzungs-berichte, Jahrg, 1874. 1 vol. 8vo.

NATURFORSCHENDER VEREIN, BRÜNN, AUSTRIA. Verhandlungen, Bd., xii. Heft I, II, 1873. 8vo.

NATURHISTORISCHE VEREIN DER PREUSSISCHEN RHEINLANDE, UND WESTPHALENS, Bonn. Verhandlungen, Jahrg, xxx, III Folge, x Bd. 1873. Jahrg xxxi, iv Folge, I Bd., 1874. 8vo.

NATURWISSENSCHAFTLICHE GESELLSCHAFT "1818" IN DRESDEN. Sitzungs-berichte, Jahrg, 1874. Apr.-Sept. 8vo.

VEREIN DER FREUNDE DER NATURGESCHICHTE IN MEKLENBURG NEUBRANDENBURG. Archiv xxviii, Jahrg, 1874. 1 vol. 8vo.

VERMONT HISTORICAL SOCIETY. Registration Reports, 1871, 1872. 2 vols. 8vo. Vermont Legislative Documents. Vols. 1, 2, 4, 1874. 3 vols. 8vo. Laws of Vermont, 1874. 1 vol. 8vo. Vermont Legislative Directory, 1874-5. 1 vol. 12mo. Records of the Governor and Council of the State of Vermont. Vol. II, 1779-1783. 1 vol. 8vo. Transaction of the Vermont Dairymen's Association, 1873-4. 8vo. pamph.

PUBLISHERS. Forest and Stream. Hardwicke's Science-Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Salem Observer. Salem Post.

Arthur L. Huntington, of Salem, was elected a resident member.

Voted, That a committee be appointed to prepare a list of officers for the year ensuing, and to report a printed ballot at the annual meeting, May 12.

The chair appointed Messrs. James Kimball, E. C. Bolles, and W. Neilson.



REGULAR MEETING, MONDAY, MAY 3, 1875.

MEETING this evening at 7.30 o'clock. PRESIDENT in the chair. W. P. UPHAM was appointed secretary *pro tem*. Records read.

Arthur W. Foote, Albert H. Smith and John Mangan, all of Salem, were duly elected resident members.

Adjourned.



ANNUAL MEETING, WEDNESDAY, MAY 12, 1875.

ANNUAL meeting this day at 3 P. M. The PRESIDENT in the chair. GEORGE M. WHIPPLE was appointed secretary *pro tem*. Records read.

The SECRETARY announced the following correspondence:—

From C. A. Cutter, Boston, Apr. 29; J. C. Holmes, Detroit, Mich., April 22; B. Quaritch, London, April 22; J. L. Sibley, Cambridge, April 11; W. W. Weildon, Concord, May 1; Bergen, The Museum, Jan. 11; Berlin, Die Gesellschaft Naturforschender Freunde, Feb. 10; Buffalo Historical Society, May 7; Minnesota Historical Society, April 20, May 6; Nassauischen Vereins für Naturkunde, Sept. 1; New England Historic Genealogical Society, May 5; Worcester Lyceum and Natural History Association, May 6.

The LIBRARIAN reported the following additions to the library :—

By Donation.

- ABBOTT, A. A. Salem Gazette, Jan. 23, 1791 to Nov. 3, 1796, Jan. 3, 1797-Dec. 29, 1797. Essex Register, Jan. 11, 1809 (No. 3).
- BOLLES, E. C. Ladies' Repository. 2 vols. 8vo. Paley's Theology. 1 vol. 8vo. Titles of Jesus. 1 vol. 8vo. Ballou's Select Sermons. 1 vol. 8vo. Course of Time, by Pollock. 1 vol. 8vo. Lacon. 1 vol. 8vo. Layman's Legacy. 1 vol. 8vo. Practical Hints to Universalists. 1 vol. 8vo. Chris and Otho. 1 vol. 8vo. Peppy's Diary. 8 vols. 8vo. Louis xiv and Court of France. 1 vol. 8vo. Lectures on Domestic Duties. 1 vol. 12mo. Universalist Magazine, 1821. 1 vol. folio. The Holy Eucharist. 1 vol. 8vo. Bards of the Bible. 1 vol. 8vo. The Old and New. 1 vol. 8vo. Life and Character of A. Lincoln. 1 vol. 8vo. Ancient History by C. Rollins. 8 vols. 12mo. History of Universalism. 1 vol. 12mo. Notes on the Parables. 1 vol. 12mo. History of the Churches of New York. 1 vol. 12mo. Doddridge on Religion. 1 vol. 12mo. Ballou Review. 1 vol. 12mo. Universalist Hymn Book. 2 vol, 12mo. The Prophecies of Daniel. 1 vol. 12mo. Winchester Dialogues. 1 vol. 12mo. Jordan's Review. 1 vol. 12mo. Review on Hall. 1 vol. 12mo. Law of Kindness. 1 vol. 12mo. Rayner's Lectures. 1 vol. 12mo. Pin-gree's Debate. 1 vol. 12mo. History of the Waldenses. 1 vol. 12mo.
- COLBY UNIVERSITY. Charter of, with Acts and Resolves. 1875. 8vo.
- GOODELL, A. C. Address before the Essex Institute, Oct. 5, 1874, at the Centennial Anniversary of the Meeting of the Provincial Assembly in Salem, Oct. 5, 1774. 1 vol. 8vo.
- HUNT, T. F. Designs for Parsonage Houses, etc. 1 vol. 4to.
- LEE, JOHN C. Commercial Bulletin, Apr. 24, May 1, 1875.
- MASSACHUSETTS HORTICULTURAL SOCIETY. Transactions of, Year 1874. Pt. II.
- PACKARD, A. S., Jr. Boston Directory, 1847-8. 1 vol. 8vo.
- PERKINS, GEO. A. Robinson Crusoe, by D. Defoe. 1 vol. 8vo. Siege of Corinth. 1 vol. 18mo. Evelina, by Miss Burney. 1 vol. 18mo. Life of John Wielcliff and others, by W. Gilpin. 1 vol. 12mo. Life of T. Scott. 1 vol. 12mo. Bacon's Novum Organum Scientiarum. 1 vol. 12mo. Grey's Hudibras. 2 vols. 8vo. Moore's Zeluco. 2 vols. 8vo. Modern Pilgrims, by Wood. 2 vols. 8vo. Spirit of Missions. 20 numbers. Miscellaneous pamphlets, 120.
- U. S. PATENT OFFICE. Official Gazette, Apr. 6, 13, 1875.
- WHIFFLE, GEO. M. Mass. Special Laws, Vols. 9, 10, 1849-50. 2 vols.

By Exchange.

- ARCHIV FÜR ANTHROPOLOGIE. Band vii, Heft. II, 1875.
- BOSTON PUBLIC LIBRARY. Bulletin for April, 1875.
- BOWDOIN COLLEGE. Seventy-third Annual Catalogue of. 1874-5. 8vo pamph.
- KÖNIGLICHE BAYERISCHE BOTANISCHE GESELLSCHAFT REGENSBURG. Flora, 1874. 1 vol. 8vo.
- LITERARY AND PHILOSOPHICAL SOCIETY OF LIVERPOOL. Proceedings of the. Vol. xxviii, 1873-4.
- NEW JERSEY HISTORICAL SOCIETY. Proceedings of the. Vol. iv, 2d Series, No. I, 1875. 8vo.
- PUBLISHERS. American Journal of Science. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Salem Observer. Salem Post. The Western. Turner's Public Spirit.

[To be continued.]

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 7. SALEM, MASS., JUNE, 1875. No. 6.

One Dollar a Year in Advance. Ten Cents a Single Copy.

ANNUAL MEETING, WEDNESDAY, MAY 12, 1875.

[Continued.]

The annual reports of the officers and curators were read and accepted, and from them the accompanying

RETROSPECT OF THE YEAR

has been compiled, presenting in a concise form the work of the Institute, in its various departments, since the last annual meeting.

MEMBERS.—Changes occur in the list of our associates by the addition of new names, and the withdrawal of some by resignation, removal from the county or vicinity, and by death. In this connection notices of five of the resident and two of the corresponding members, who have deceased during the year, are inserted.

Joseph Sebastian Cabot, died at his residence in Salem, on Monday afternoon, June 29, 1874. He belonged to a

family which has been prominent for a century and three-quarters in the annals of Salem. He was born in Salem October 8, 1796, and was the son of Joseph and Esther Orne (Paine) Cabot, grandson of Joseph and Rebecca (Orne) Cabot, great-grandson of Joseph and Elizabeth (Higginson) Cabot, great-great-grandson of John and Anna (Orne) Cabot. The last named ancestor, John Cabot, came to Salem about the year 1702, from the Isle of Jersey. After graduating from Harvard College, in the class of 1815, he studied law for a while in the office of Hon. Leverett Saltonstall, but did not pursue the study long. In 1829 he became President of the Asiatic Bank, and so continued until his death, with brief intervals while he was Bank Commissioner and during two visits to Europe. Mr. Cabot took a deep interest in the organization of the Harmony Grove Cemetery Corporation in 1840, and was a Trustee and President until his decease. He was also long a President of the Salem Savings Bank, and for many years on one of its most important committees. For several years he was President of the Massachusetts Horticultural Society, and was noted for his enlightened interest in, and taste for, horticultural and kindred pursuits. In 1843 and 1844 he served as an Alderman of the city, and in 1845-6-7 and 8, he was the Mayor of Salem, performing the duties with great efficiency and success. Mr. Cabot was twice married; first, August 2, 1843, to Martha Laurens Stearns, of Worcester, who died April 21, 1844; and secondly, March 3, 1852, to Susan Burley Howes (daughter of the late Frederick Howes, Esq.), who survives him. The deceased was a very companionable and courteous gentleman, and his financial skill was constant'y at the service of his fellow citizens.

Edward Brooks Peirson, M. D., one of our most

skilful surgeons and physicians, died suddenly at his residence on Wednesday evening, November 18, 1874. He was a son of the late Dr. A. L. Peirson, likewise an eminent surgeon and physician, who lost his life by the Norwalk calamity in 1853; and was born Jan. 22, 1820, in this city. He received his early education in the Salem schools, was a graduate of Harvard in the class of 1840, studied his profession with his father and at the Harvard Medical School, and soon entered upon a very large and successful practice, particularly in surgery. For several years he was President of the Essex South District Medical Society, and was an earnest and active coöperator in all our useful local institutions for the benefit of the unfortunate. During the war he went to the southern battle fields to attend a wounded brother, and there acquired the seeds of a malarial disease from which he was never wholly freed. His sudden death will leave a lamentable void in this community. Dr. Peirson was twice married; first, to Catharine Pickman, daughter of Nath'l and Caroline (Sanders) Saltonstall (born May 18, 1823, died June 25, 1852); secondly, to Ellen, daughter of Justus and Hannah (Wood) Perry, of Keene, N. H.

Daniel Hopkins Mansfield, one of our old and efficient shipmasters, died on Thursday evening, December 24, 1874, in his 74th year. He was for several years previous to 1859, United States Consul at Zanzibar, and in 1863, 1864, and 1865, was an Alderman of this city. He joined the Salem Marine Society in 1849, and was its treasurer from 1860. He was for a quarter of a century or more a member of the First Baptist Church, and was a gentleman of simple habits and great integrity of character. He was son of Daniel Hopkins and Marcia (Tucker) Mansfield, and was born at Salem, January 14, 1801.

William Archer. On New Year's morn we were pained to hear the sudden decease of an associate which occurred during the evening previous (Dec. 31, 1874), having attended to his usual business that afternoon. He was a son of William and Elizabeth (Daniels) Archer, and was born at Salem July 27, 1816. After leaving the High School he served an apprenticeship with the late Edmund Currier, as a jeweller and silversmith, and subsequently established himself in that business, which he continued for several years in Beverly, Gloucester and Salem. In the spring of 1852 he became associated with the late Israel D. Shepard, as an auctioneer, and continued in that occupation till his death, having built up a large business as an auctioneer and real estate and insurance agent. He was industrious, prompt, energetic and faithful, to the interests confided to him. He was twice married; first, to Mary O., daughter of John H. and Lucy (Trafton) Glover; she died 9th September, 1860, aged 44 years. Secondly, June 19, 1862, to Mary J. Brown, of Charlestown.

John Barlow, one of our esteemed citizens, died on Monday afternoon, January 11th, 1875. He was the son of Henry and Catherine (Armstrong) Barlow, and was born in Shercock, Cavan County, Ireland, 10th July, 1813. He came to Salem July 3, 1823, where he has since resided. He engaged in the boot and shoe business, in which he was successful, and from which he retired several years since. He was an intelligent, thoughtful, active and useful citizen; and from his early manhood, had been associated with the military, the masonic and other bodies. He was an Alderman of the city in 1864 and 1865, and a Representative in the General Court in 1869 and 1870. He married Emeline C. Becket, daughter of Jonathan and Jane (Hyland) Campbell Becket.

Jeffries Wyman, M. D., Professor of Anatomy in Harvard College, died from a sudden hemorrhage, at Bethlehem, N. H., Sept. 4, 1874, where he had gone to escape the autumnal catarrh. He was the son of Dr. Rufus and Ann (Morrill) Wyman, and was born at Chelmsford, Mass., Aug. 11, 1814, graduated at Harvard in 1833, and soon after commenced the study of medicine. In 1843 he accepted the chair of anatomy and physiology in the Hampden-Sydney College, in Virginia. In 1847 he was appointed to succeed Dr. Warren as the Hersey Professor of Anatomy in Harvard. From 1856 to 1870 he was President of the Boston Society of Natural History. On the foundation of the Museum of American Ethnology and Archæology at Cambridge, he was named one of the seven trustees, and was at once requested by his fellow members of the board to take charge of the museum as its curator. The seven annual reports on the condition and accessions to the new museum are evidences of what he did in that direction. He also communicated to the Natural History Society, the American Academy of Arts and Sciences, and to various scientific journals, over one hundred important papers, the results of anatomical and anthropological studies. He married in December, 1850, Adeline Wheelwright, who died in June, 1855, leaving two daughters. He married secondly, in August, 1861, Anna Williams Whitney, who died February, 1864, leaving one son.

Nathaniel Bradstreet Shurtleff, M. D., died in Boston (Dorchester District), October, 17, 1874. He was born in Boston June 20, 1810, and was the son of Dr. Benjamin Shurtleff, a veteran practitioner of eminence. After his graduation at Cambridge in 1831, he commenced the study of medicine, taking his degree in 1834. In early life he was interested in anatomical studies, but latterly

his taste lay in other directions, especially in early New England history. His numerous antiquarian and historical works will cause him to be long remembered. He was for many years one of the trustees of the Boston Public Library, a member of the School Committee, and for three years Mayor of the city. He was also member of the Board of Overseers of Harvard College, and for a long period the Secretary. A ceaseless activity characterized his whole life, and no man was more familiarly known, or had connected himself with so many associations, either of a permanent or temporary purpose. In July, 1836, he was married to Sarah Eliza, daughter of Hiram Smith, of Boston.

MEETINGS.—During the summer and early autumn five *Field Meetings* have been held. The first at Ipswich, on Wednesday, June 3, 1874. At the afternoon session, in the First Church, Prof. E. S. Morse, of Salem, spoke on "the fertilization of flowers;" Mr. F. W. Putnam gave an account of the shell heaps at the Light House and at Eagle Hill; Rev. T. Morong an historical notice of the Public Library the gift of Augustine Heard, Esq. *Second*, at Topsfield, Thursday, June 18, 1874. The afternoon session, in the Methodist Church, was attended by a goodly number of the citizens. Rev. James H. Fitts of Topsfield communicated a paper on "Robert B. Thomas, the maker of the Farmer's Almanac;" Vice-president F. W. Putnam gave an account of the fishes taken from Ipswich River; Charles J. Peabody gave a brief history of Topsfield; Dr. Jeremiah Spofford of Groveland, B. P. Adams of Topsfield, Richard Phillips, Samuel Todd and Charles H. Holmes, offered remarks. *Third*, at *West Newbury*, Thursday, July 18, 1874. At the session, in the Second Church, George D. Phippen of Salem, spoke on the flowers

that had been collected, and also on the unwelcome class found in our gardens, known as weeds; Mr. John Robinson spoke of the ferns; Messrs. D. B. Hagar of the State Normal School in Salem, Abner G. Phipps, agent of the State Board of Education, J. Spofford of Groveland, Haydn Brown of West Newbury, Stephen M. Allen of Boston, and W. H. H. Marsh of Salem, were among the speakers. *Fourth*, at Rockport, Thursday August 6, 1874. Afternoon session in the Town Hall, Alfred Osgood of Newburyport, F. W. Putnam of Salem, A. W. Dodge of Hamilton, Albert H. Tuttle of the Ohio Agricultural and Mechanical College, Columbus, Rev. A. B. Hervey of Troy, N. Y., James Kimball of Salem, and others, addressed the meeting. *Fifth*, at Manchester, Friday October 2, 1874, by invitation of Mr. Lewis Tappan and other citizens of that town; the afternoon session at the Town Hall; among the speakers were F. W. Putnam, E. S. Morse, John Robinson and Rev. E. C. Bolles, all of Salem.

Evening Meetings have been held at the rooms, usually on the first and third Monday evenings of each month. At these meetings an increasing interest was manifested, and several valuable communications were presented, abstracts of which have been printed in the BULLETIN, or reserved for the HISTORICAL COLLECTIONS. The following may be specified: "A talk upon Art," by Charles C. Perkins, of Boston; "Observations among the various Scientific Collections of London," by E. C. Bolles; "A List of Birds observed at various localities contiguous to the Central Pacific Railroad, from Sacramento City, Cal., to Salt Lake City, Utah," by Robert Ridgway; "Fishes and Crayfishes from Mammoth Cave," by F. W. Putnam; "An account of the process in the manufacture of glass,"

by John Robinson; "On the Theory of Evolution," by E. S. Morse; "An account of the Archæological Discoveries of the Hayden Expedition," by F. W. Putnam; "Archæological Researches in Kentucky," by F. W. Putnam; "Comb Manufacturing," by Haydn Brown; "On the System of Visible Speech," by A. Graham Bell; "Ferns of Essex County," by John Robinson; "On the Fortifications and other enclosures made by the Indians and the older races in North America," by F. W. Putnam; "Synonymy, description, history, distribution, and habits of the Prairie Hare" (*Lepus campestris*), by Elliott Coues; "The applications of Galvanic Electricity to a few of the arts of every day life," by J. H. Stevens; "On East Indian and Japanese Paper," by E. C. Bolles. At the meeting on the 16th of November, 1874, a full account was given of the examination of an Indian burial place in Marblehead, and the finding of several skeletons *in situ* by A. C. Goodell, Jr., W. P. Upham, E. S. Atwood, C. Cooke, E. S. Morse, A. H. Johnson and E. C. Bolles, who were present at the examination and excavation. The centennial anniversary of the meeting of the Provincial Congress at Salem, was duly observed at the Rooms of the Institute, October 5, 1874, by an address from Vice-president A. C. Goodell, Jr., and a social gathering.

LECTURES AND CONCERTS. — An interesting series of eight lectures, concerts and entertainments were given in Mechanic Hall. 1st, Monday, Nov. 9, James Steele Mackaye, upon the "Philosophy of Dramatic Expression; 2d, Monday, Nov. 23, concert by the Boston Swedish singers; 3d, Saturday, Dec. 5, concert by Theodore Thomas, with his full orchestra of sixty performers; 4th, Monday, Dec. 14, Charles C. Perkins of Boston, on

"Art," illustrated by the calcium light; 5th, Monday, Jan. 11, Rev. E. C. Bolles of Salem, "Rambles in Europe," illustrated; 6th, Monday, Jan. 25, Daniel Dougherty, Esq., of Philadelphia, on "Oratory"; 7th, Monday, Feb. 8, Rev. E. C. Bolles of Salem, "Rambles in Europe," illustrated by means of the lantern; 8th, Monday, March 15, Prof. A. M. Mayer, of Stevens' Institute, "Sound and how we hear," illustrated by fine lantern pictures.

Also a *supplementary course*, which comprised a concert by the Schumann Club of Boston, under the direction of Mr. Carlyle Petersilea, on Monday, May 3d; Select Readings by Prof. J. M. Churchill, of Andover; and a Lecture by Rev. E. C. Bolles, of Salem, subject "Rambles Abroad," are announced to be given soon.

In addition to the above, James Steele Mackaye, delivered a lecture, at the Rooms in Plummer Hall, Tuesday, Nov. 24, on "The Life, Labors, and Peculiar Discoveries of Francois Delsarte," and on Thursday, March 25, Mr. E. Ingersoll, a lecture on "The Ancient Inhabitants, or Cliff Dwellers of the Canons of the Colorado Valley."

HORTICULTURAL. — The operations of this department have been successfully conducted during the past season. Five exhibitions have been held, two devoted to the show of special flowers, the others more general in their character. 1st, on Saturday evening, June 27; a beautiful display; *Cereus nycitcollis* (variety of Night Blooming *Cereus*) a native of Mexico; *Phyllocactus crenatus*, and several other species of cacti; *Cypripedium spectabile*, etc. 2d, Tuesday and Wednesday, June 30 and July 1, the rose show. 3d, Tuesday, July 21, special; *Clerodendron Balfouri*; *Alamanda Scottii*, etc. 4th, Wednesday, July 29: 5th, the Annual, from Tuesday, Sept.

15, to Friday, Sept. 18, maintained the usual character for a display of many choice and beautiful flowers and fine fruit, vegetables, etc., though the decorations were not so elaborate as in some previous seasons. The following prizes and gratuities were awarded:—*Flowers*. Cut flowers; 1st, Charles A. Putnam, 2d, John Robinson, 3d, C. A. Beckford. Pot Plants; 1st, David M. Balch, 2d, John Robinson. Stand of growing plants; 1st, John Robinson. Arranged Basket of Cut Flowers; 1st, C. H. Buxton. Collection of Gladioli; 1st, Charles A. Putnam. Parlor Bouquet; 1st, Mrs. Arthur Kemble. Wardian Case; 1st, John Robinson. Ferneries, circular; 1st, John Robinson. *Fruit*.—Collection of Pears; 1st, Wm. Maloon, 2d, Joseph A. Goldthwaite. Best single dish of Bartletts; T. Putnam Symonds. Best single dish of Seckel; T. Putnam Symonds. Best single dish of Duchess de Angouleme; Charles A. Ropes. Best single dish of Louise Bonne; R. G. Goss. Collection of Apples; 1st, C. A. Ropes, 2d, H. F. Skerry. Best single dish of Apples; Henry Very. Collection of Peaches; 1st, George Bowker, 2d, Charles M. Richardson. Best single dish of Peaches; F. Lamson. Best single dish of Rogers No. 4 and 15; H. F. Skerry. Best Hartford Prolific; T. Putnam Symonds. Best Creveling; George Russell. *Vegetables*.—Best peck of Early Rose Potatoes; E. C. Larrabee. Best four Marrow Squashes; Plummer Farm School. Best four heads of Cauliflowers; E. C. Larrabee. Best five heads of Cabbages; Plummer Farm School. Best dish of Trophy Tomato; W. F. Gardner. Best dish of other varieties of Tomato; E. C. Larrabee. Best five Beets; Plummer Farm School. Best peck of Onions; Plummer Farm School. Largest and best-shaped Squash; Plummer Farm School. Very large and fine Sweet Corn; S. D. Tilton.

ART EXHIBITION. — At the quarterly meeting in February, it was mentioned that the Misses Mary E. and Abby O. Williams of Salem, would be willing to deposit in the Rooms of the Institute, temporarily, their valuable collection of Paintings, many of which were copied by them from the "old masters," during a residence of several years in Rome. After some conversation, the subject was referred to the Curators of the department of Art, to make the necessary arrangements, and to tender to the ladies the sincere thanks of the Institute for this liberal proposal. The collection was received on Thursday, March 4, and it was deemed expedient, with so fine a basis, to have an Art Exhibition, and to solicit contributions to this end, though not without some slight misgivings of its success, and thus fulfilling a long cherished desire of those connected with the Institute.

The Exhibition was opened Thursday, March 11, and continued to Friday evening, March 19. The result was a surprise to all parties interested. From the first day that notice was given, pictures of all kinds were sent in with the greatest liberality, until some three or four hundred had been collected and hung upon the walls of the exhibition room. They comprised oil paintings, water colors, charcoal sketches, pen and ink drawings, and engravings; among them were works of decided merit. The sides of the hall were almost entirely covered with cloth of a maroon color, against which the pictures were suspended. The alcoves, which seemed at first to present some difficulties, were fitted up with frames, arranged so as to produce indentations or recesses in the sides of the hall, and gave an extremely pleasing effect. All four sides of the room were completely covered with pictures; a long array of gas burners fitted with reflectors, threw down upon them a brilliant light, so that the

entire effect of the scene was very cheerful, pleasant and enlivening.

The whole number of pictures registered was three hundred and forty; a Catalogue of which was printed in the April number of the BULLETIN for the present year.

LIBRARY.—The additions by donations and exchange during the year are as follows:—

Donations.

Folios,	31	Pamphlets and Serials, . . .	5,603
Quartos,	37	Almanacs,	77
Octavos,	457		—
Duodecimos,	168	Total,	5,680
Sexdecimos,	36	Total of bound volumes, . .	729
	—		—
Total,	729	Total of Donations,	6,409

Exchanges.

Quartos,	1	Pamphlets and Serials, . .	835
Octavos,	141	Total of bound volumes, . .	145
Duodecimos,	3		—
	—	Total of Exchanges, . . .	980
Total,	145	Total of Donations,	6,409
			—
		Total,	7,389

Of the total number of pamphlets and serials, 3,143 were pamphlets, and 3,295 serials.

The donations to the Library for the year have been received from one hundred and three individuals and fifteen societies and departments of the General and State Governments. The exchanges from seventy-five societies and incorporate institutions, of which forty-six are foreign; also from editors and publishers.

From the editors of the "American Naturalist" forty-five serial publications.

MUSEUM. — Many valuable specimens in natural history have been given during the year, and are on deposit with the Trustees of the Peabody Academy of Science, in accordance with previous arrangements. These have been reported at our meetings, and have been duly acknowledged to the several donors. In addition to the above, several interesting specimens of an historical character have been deposited in the Rooms of the Institute, and contribute very much of interest and value to the antiquarian and historical portion of the Museum. A Committee appointed for the purpose have rearranged the collection of relics, and local antiquities in the eastern ante-room, and by the efforts of Rev. E. C. Bolles and others, several series of specimens in Technology have been added.

PUBLICATIONS. — The BULLETIN has been continued in monthly numbers, giving full reports of the doings of the Institute, and abstracts of papers read at the meetings. The HISTORICAL COLLECTIONS, Vol. xii, Nos. 3 and 4, and Vol. xiii, No. 1, have been printed.

FINANCIAL. — The Treasurer's Report shows the following receipts and expenditures during the year. Additional means are requisite to perform, in a suitable manner, the various duties which the members may reasonably expect.

DEBITS.

General Account.

Athenæum, Rent, etc., \$350.00; Salaries, \$745.00; Coal, \$160.50, . . .	\$1,255.50
Lectures, \$116.55; Express, \$43.32; Postage, \$10.50, . . .	170.37
Insurance, \$50.00; Rosetta Stone, \$16.00; Gas, \$68.35, . . .	134.35
Photographs, \$35.84; Publications, \$1,129.27, . . .	1,165.21
Collecting, \$5.00; Sundries, \$23.38, . . .	28.38

Historical.

Binding, \$85.00; Books, \$10.00, . . .	105.00
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Natural History and Horticulture.

Horticultural Exhibitions, \$90.43; Sundries, \$5.89, . . .	96.32
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	\$2,955.13

CREDITS.

General Account.

Dividends Webster Bank,	80.00
Assessments, \$1,278.00; Publications, \$483.05,	1,761.05
Life Membership, \$30.00; Sundries, \$134.63,	164.63
Athenæum, proportion of coal and janitor,	155.25
Cash at beginning of year,	132.68
Balance due Treasurer,	89.58

Historical.

Dividends Naumkeag Bank,	22.90
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Natural History and Horticulture.

Dividends P. S. & P. R. R., \$20.00; Lowell Bleachery, \$64.00, . .	84.00
Horticultural Exhibitions,	85.94

Davis Fund.

Coupons Burlington and Missouri R. R.,	240.00
Coupons Dixon, Peoria and Hannibal R. R.,	140.00
	<hr/>
	\$2,955.13

The receipts and expenditures on account of the recent courses of lectures and entertainments, and the Art Exhibition in March, which were severally placed in charge of the curators of the department of the Arts, are not included in the above statement; the supplementary course not having been concluded. The same will be carried to the next year's account.

Mr. W. P. UPHAM read a new draft of the Constitution and By-laws, as prepared by the special Committee appointed at the meeting held on the 16th of November last. After discussion the further consideration was deferred to the next quarterly meeting on the second Wednesday of August.

The following Officers were then elected, until others shall be chosen in their stead :—

President.

HENRY WHEATLAND.

Vice Presidents.

Of History—A. C. GOODELL, JR. *Of Natural History*—F. W. PUTNAM.
Of Horticulture—WILLIAM SUTTON. *Of the Arts*—D. B. HAGAR.

Recording and Home Secretary.

GEO. M. WHIPPLE.

Foreign Secretary.

A. S. PACKARD, JR.

Treasurer.

HENRY WHEATLAND.

Librarian.

WILLIAM P. UPHAM.

Superintendent of the Museum.

T. F. HUNT.

Curators of Historical Department.

W. P. Upham, M. A. Stickney, James Kimball.

Curators of Natural History Department.

H. F. King, G. A. Perkins, William Nellson.

Curators of Horticultural Department.

T. F. HUNT, D. M. Balch, W. P. Andrews.

Curators of Department of the Arts.

C. H. Higbee, James A. Gillis, George M. Whipple.

Finance Committee.

John C. Lee, Jas. Upton, Geo. D. Phippen, Jas. O. Safford.

Lecture Committee.

D. B. Hagar, George Perkins, William Northey, C. H. Higbee,
E. C. Bolles, A. H. Johnson.

Field Meeting Committee.

A. W. Dodge, E. N. Walton, N. A. Horton, Alfred Osgood.

Library Committee.

J. G. Waters, E. B. Willson, Geo. F. Flint.

Publication Committee.

A. C. Goodell, Jr., F. W. Putnam, R. S. Rantoul,
Henry M. Brooks, E. S. Atwood.

On motion of Mr. C. H. HIGBEE it was

Voted, That the thanks of the Essex Institute be tendered to the officers and members of the Schumann Club, of Boston, for their valuable services gratuitously rendered, at the concert given on the evening of May 3d, in the Supplementary Series of Lectures and Entertainments.

James Silver Williams and Henry F. Perkins, both of Salem, were elected resident members.

Adjourned.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 7. SALEM, MASS., JULY, 1875. No. 7.

One Dollar a Year in Advance. Ten Cents a Single Copy.

FIELD MEETING AT HAMILTON, THURSDAY, JUNE 3, 1875.

THE first field meeting of the season was held at the Chebacco House, in Hamilton, this day. There is much that is enjoyable about the woods and ponds in the vicinity of the hotel, and the place is thereby very popular as an objective point for parties during the summer months. It is also a favorite resort for the zoologists and the botanists, as the finding of many of our animals and plants, some of exceeding interest, are frequent rewards of a half day's tramp. The members of the Institute are, therefore, always pleased in the selection of this place for one of their field days.

The Proprietors of the House, the Messrs. Whipple, are always courteous and very assiduous in their efforts to promote the objects of these meetings, and to contribute to the comfort of the members and friends in attendance.

The forenoon was devoted to the usual rambles in search of objects of interest, as the inclination of each dictated, and many fine specimens were found. At one o'clock lunch was partaken in the woods near the house.

At 2.30 P. M. the afternoon session was held in the Hall of the Chebacco House. The PRESIDENT in the chair.

The records of preceding meeting were read.

Vice President F. W. PUTNAM gave an interesting account of his late visit to Newburyport for the purpose of examining some curious groups of stones recently found by W. C. Johnson, Esq., of that city, while prospecting on his land, about four miles from the city, near Parker River. These stones were in a few instances of such singular arrangement as to lead to the supposition that they possibly indicated something of archæological importance.

Mr. Putnam mentioned that besides a row of piles of stones, each about eight feet in diameter, there was found a few hundred feet distant a singular arrangement of small stones, in the form of the letter E, the length of the letter being six feet, and the width about two feet. Near this was a small circle of stones about four feet in diameter, with a number of stones inside the circle. Near this was a slight earth mound. In the immediate vicinity were a number of small heaps of shells. These were the surface indications; and while there was undoubted evidence of the stones having been placed in these positions a long while ago, so that the soil and sod had nearly covered them, still there was nothing that indicated a great antiquity.

Excavations were begun in the expectation of finding that the stones had been placed as marks of sepulture, but nothing except a small piece of Indian pottery was

brought to light. Finally the small earth mound was opened, and the clay, burnt to some depth, showed that a fire had been kept there for a long time. Pieces of the old-fashioned square brick, fragments of green window glass and lead sash, such as were imported by the first settlers, were also found, showing that part, at least, of the mound had been caused by some of the early settlers, though there is no tradition of the land in question ever having been settled upon or cleared for cultivation.

Thus, after a most careful consideration, the singular arrangement of the stones remains a mystery. That any white person should take the trouble to arrange the stones, as found, seems improbable, while the absence of signs of burial under them, would indicate that if made by the Indians, they were for the purpose of simply marking the spot for some particular reason. Stone piles of various shapes have been found in different parts of the country, evidently the work of the Indians, and it may be that these at Newburyport, which was a well known resort of the Indians, were also their work, though nothing definite could be obtained as to their origin. Photographs of these heaps were exhibited.

Mr. ALFRED OSGOOD of Newburyport, said that the early white settlers sometimes used stones to mark their fishing grounds, and suggested that these heaps might be for that purpose.

Mr. PUTNAM wished publicly to thank Mr. Johnson for his thoughtfulness in calling attention to these curious piles of stones, as often very valuable relics are found by a little care and research, from indications far less promising in appearance than those in question, though often, as in the present case, an examination may prove them to be unimportant.

Mr. OSGOOD gave an informal talk on the present aspect of the mining lands and the presence of minerals in the vicinity of Newburyport, and expressed himself rather skeptical as to the richness and value of any of the deposits yet found. Without doubt valuable ore is there, though whether it would pay to work the mines, expecting a large yield, is questionable. He thought that no new discoveries had been made favorable to such an opinion.

Mr. J. H. STEVENS of Salem, being called upon, said that the Institute was doing much to develop among the people, and particularly the young people, a knowledge of natural history. He then gave an interesting account of the growth of the cane brakes (*Arundinaria macrosperma*) in the Southern States. Hundreds of miles of country along the Mississippi bottoms are covered by these brakes, some growing to the height of twenty-five or thirty feet. When young and tender the leaves furnish food for deer and other animals. He had often wandered, rifle in hand, through that country, and felt the want of the kind of knowledge that the Essex Institute and these field meetings were disseminating in order to appreciate the opportunities for the study of nature there presented.

He also spoke of the American Tulip Tree (*Liriodendron tulipifera*), which grows luxuriantly in the same vicinity, and when in bloom presents the appearance, as seen from the high bluffs, of an immense flower garden extending sometimes for miles.

Mr. PUTNAM said that in the Mammoth and several other caves in Kentucky there were often found pieces of canes, with one end burned, and it was supposed that they had been filled with grease and used as torches by some of the Indian race, who, to a certain extent, used the caves for various purposes.

Miss L. H. UPTON of Salem presented the following list of plants found in bloom during the excursion :

LIST OF PLANTS FOUND IN FLOWER AT ESSEX,
JUNE 3, 1875.

- Anemone nemorosa* L. Wind-flower.
- Ranunculus abortivus* L. Small-flowered crowfoot.
- ✓ *Ranunculus acris* L. Buttercups.
- ✓ *Coptis trifolia* Salisb. Gold-thread.
- ✓ *Aquilegia Canadensis* L. Columbine.
- ✓ *Sarracenia purpurea* L. Pitcher-plant.
- ✓ *Viola lanceolata* L. Lance-leaved white violet.
- ✓ *Viola blanda* Willd. Sweet white violet.
- ✓ *Viola cucullata* Alt. Blue violet.
- ✓ *Prunus Pennsylvanica* L. Wild red cherry.
- ✓ *Potentilla Canadensis* L. Cinque-foil.
- ✓ *Fragaria Virginiana* Ehr. Wild strawberry.
- Amelanchier Canadensis* Torr. & Gray. June-berry.
- ✓ *Aralia nudicaulis* L. Wild sarsaparilla.
- ✓ *Cornus Canadensis* L. Dwarf cornel. Bunch-berry.
- ✓ *Oldenlandia cœrulea*. Houstonia.
- Antennaria plantaginifolia* Hook. Mouse-ear.
- ✓ *Taraxacum dens-leonis* Desf. Dandelion.
- ✓ *Vaccinium Pennsylvanicum* Lam. Dwarf blueberry.
- ✓ *Vaccinium corymbosum* L. High blueberry.
- ✓ *Trientalis Americana* Pursh. Star-flower.
- Veronica serpyllifolia* L. Thyme-leaved speedwell.
- ✓ *Rumex acetosella* L. Sheep sorrel.
- ✓ *Arisæma triphyllum* Torr. Indian turnip. Jack in the pulpit.
- Corallorrhiza innata* R. Brown. Coral-root.
- Cypripedium acaule* Alt. Lady's slipper.
- ✓ *Sisyrinchium Bermudianum* L. Blue-eyed grass.
- ✓ *Polygonatum biflorum* Ell. Smaller Solomon's seal.
- Smilacina racemosa* Desf. False spikenard.
- Smilacina bifolia* Ker. Wild lily of the valley.
- Medeola Virginica* L. Indian cucumber root.

After remarks from Dr. J. P. Fessenden, Rev. S. C. Beane and Messrs. E. N. Walton and N. A. Horton of Salem, and the adoption of a vote of thanks to the Messrs. Whipple of the Chebacco House, for their kindness in placing at the disposal of the Institute their house and grounds for the day, the meeting adjourned.

REGULAR MEETING, MONDAY, JUNE 21, 1875.

Regular meeting this evening at the rooms. The **PRESIDENT** in the chair. Records read.

The **PRESIDENT** read extracts from the will of the late Abby W. Ditmore of Salem bequeathing to the Institute certain sums, subject to conditions which were stated. As the full amount of the bequests was not to be paid at present, the matter was laid over for action at a future meeting.

The **PRESIDENT** stated that a collection of documents, papers, prints, etc., relating to the various centennial celebrations of this period had been commenced, and requested contributions from members and friends to this object.

Mr. **CHARLES H. HIGBEE** stated that he had received some very fine and valuable specimens of algæ from Mrs. A. L. Davis, Mrs. H. A. Cochran and Mrs. Bray of Gloucester, also from N. S. B. Herbert of Lynn, and that these specimens would be placed in the Institute collection. He desired thus publicly to thank these persons for their kindness and attention.

J. H. Stevens, Philip H. Kimball and Miss Mary E. Kinsman of Salem, and H. M. Cross of Newburyport, were duly elected resident members.

The **PRESIDENT** alluded to the decease of one of our associates, **CHARLES WENTWORTH UPHAM**, which took place on Tuesday morning, June 15, 1875, and gave a brief account of his connection with the Society and of his strong interest in its objects. He spoke also of his

early life and of his various literary labors, and of his interest in the establishment of the State Normal School in Salem.

Gen. HENRY K. OLIVER of Salem made some very appropriate remarks on the death of Mr. Upham, and in conclusion offered the following resolutions for the consideration of the meeting.

Whereas, it has pleased the Supreme Ruler of events to remove by death our honored and venerated associate and fellow citizen, CHARLES WENTWORTH UPHAM, long connected with the Essex Institute, and for half a century identified with this community in many relations :

Resolved, That the members of the Institute, deeply feeling the irreparable loss it has sustained, enroll his name with unfeigned grief among the most eminent of its past associates.

Resolved, That while we mourn the loss of so valued a member of our society, and so justly esteemed a citizen, our sorrow is tempered as we look back upon a life, so true to all the purposes of life, and read the record of the varied virtues and singular excellencies, which characterized the whole career of our departed associate.

Resolved, That in his career as a faithful and earnest minister of the Gospel, in his zealous labors as a citizen for the best interests of our community, as a patriotic officer in state and nation, as a successful laborer in the fields of literature, biography and history, he has for himself fully won the highest reputation, and conferred increased distinction upon our ancient municipality.

Resolved, That as we review the long and inspiring catalogue of the great and good men, who from its earliest days have adorned and illustrated our historic city, our just pride receives a new impulse, in adding to the honored roll the name of one so fully entitled to receive reverent admiration and honor, among the most highly honored and revered.

Rev. E. C. BOLLES moved the adoption of these resolutions, and paid an eloquent tribute to the character and memory of Mr. Upham.

Rev. E. S. ATWOOD heartily endorsed the resolutions offered by Gen. Oliver. He spoke of his long and valued intimacy with Mr. Upham, who had often expressed to him his great interest in the various clergymen of the city, without regard to sect or denomination; also of his valuable advice as to the best method of professional life; of his interest in the Institute and its objects; of his extensive knowledge of books in the various departments of literature; of his quick intellect and cheerfulness of mind to the end of life.

After further remarks from Messrs. C. H. Higbee and A. C. Goodell, Jr., the resolutions were unanimously adopted.

Rev. E. S. ATWOOD said that some more formal notice should be taken of the death of so distinguished a member of the Institute, and suggested that it might be well to hold, at some future time in the rooms of the Society, a memorial meeting, at which time a memoir of the deceased should be read, and moved that a committee be appointed to consider the subject. The motion was adopted, and Messrs. E. S. Atwood, E. C. Bolles, H. K. Oliver, A. C. Goodell, Jr., and F. W. Putnam were appointed as the Committee.

Adjourned.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 7. SALEM, MASS., AUGUST, 1875. No. 8.

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FIELD MEETING AT BYFIELD, THURSDAY, JULY 1, 1875.

THE second field meeting of the Essex Institute for the present season was held this day, at Byfield, a locality highly suitable for a gathering of this character; its historical associations cannot fail to interest the student in our local history, and its diversified scenery and natural conditions offer a wide field for the exploration of the naturalist.

This territory, through which the Parker River flows, having upon its adjacent interval lands some of the most fertile farms of the county, was granted in 1635, a large portion on the south side to Richard Dummer and on the north to Henry Sewall, whose descendants have ever since held prominent positions in the history of this country. These lands, more especially that portion near "The Falls," so called, were first used for the keeping of cattle and sheep that came over in the Dutch ships in 1635, and were owned by Richard Dummer, Henry

Sewall and Richard Saltonstall. It appears that for several years afterwards attention was given to the raising of sheep in this place.

The people living in this territory, part of which is in the township of old Newbury and part in that of old Rowley, being at a distance from the churches of the two towns, in 1702 built a church and established a parish under the name of "Rowlberry." In November, 1706, it was organized as the "Falls Parish," and Rev. Moses Hale was settled as the first minister. In 1710 it was incorporated as that of Byfield in honor to Nathaniel Byfield,¹ a liberal benefactor to the parish.

To visit this place the members of the Institute and their friends took the cars of the Eastern Railroad, the principal portion at Salem, the others at the several stations on the route, for Newburyport and thence proceeded to Byfield, six miles distant, in barges furnished by Mr. Enoch T. Northend, proprietor of the Newburyport and Amesbury Horse Railroad. The route taken was somewhat circuitous in order to favor the party with an inspection of the mining region and other notable places in the vicinity. A halt was made near the Highfield mines, where an hour was pleasantly passed in examining the grounds and witnessing the mining operations, by the courtesy of Messrs. Patterson, Chipman and Boynton.

At the Boynton Mine, in charge of Mr. Robertson, the shaft is the deepest in the whole district. The ore last taken out is the best. The Chipman works, under the care of Mr. Patterson, have assumed an orderly and pros-

¹ Col. Nathaniel Byfield, son of Rev. Richard Byfield of Long Dutton in Sussex, came to New England in 1674. He was speaker of the House of Representatives in 1693; a colonel, Judge of Probate and Common Pleas for the new county of Bristol, afterwards of Suffolk, also of his Majesty's Council, etc. He died June 8, 1733.

perous appearance. A new building has been erected, 65 × 30 feet with attachments, that give an engine house, a blacksmith and machine shop, pumping gear, tool room, office and shaft-house combined. All the machinery is said to be of the most approved kind. The mine has been timbered. From the depth now obtained, seventy-five feet, laterals are being run out north, east and south.

The next stopping place was at the fork of the road near the "Longfellow house," the "Indian burial grounds" and the "cave." All three of these places were visited. The house in which the great-grandfather of the present Henry W. Longfellow was born is on a slightly spot, surrounded by rich, smooth fields. It is now in a dilapidated condition. It was probably built in the early part of the last century by Stephen Longfellow, a son of William,² the emigrant ancestor, who came in his youth to Newbury, and married, Nov. 10, 1678, Ann, daughter of Henry

² William Longfellow,¹ born about 1651, in Hampshire, Eng., came in his youth to Newbury; m. Nov. 10, 1678, Ann, daughter of Henry Sewall. He was ensign of the company that embarked in the expedition of Sir Wm. Phips against Quebec, and with nine others was shipwrecked on the return at Anticosti (one account says Cape Breton) in October, 1690.

Stephen Longfellow,³ son of the above, b. at Newbury 22 Sept., 1685; m. 25 Mar., 1713, Abigail, daughter of Rev. Edward Tompson of Marshfield. He was a lieutenant and a selectman; d. 17 Nov., 1764, at Byfield.

Stephen Longfellow,³ son of the above, b. at Byfield 7 Feb., 1723, gr. Harv. Coll. 1742; went to Portland Apr. 11, 1745, and opened a school. He was for many years one of the most active, useful and intelligent men in the town; town clerk, register of Probate and clerk of Judicial Courts; he married in 1749 Tabitha Bragdon, of York, Me. He died at Gorham, Me., in 1790.

Stephen Longfellow,⁴ son of the above, born at Portland in 1750, went to Gorham in 1775. He was largely employed as a surveyor, selectman, etc. Judge of C. C. P., Rep. & Senat. in State Legis. In 1773 m. Patience Young of York, Me. He died in Gorham in 1824, aged 74 years.

Stephen Longfellow,⁵ son of the above, born in Gorham Mar. 23, 1776, gr. Harv. Coll. 1798, studied law, and on being admitted to the bar in Portland he entered at once upon a large practice and stood in the front rank of able counsellors; member of the Hartford convention in 1814, also a member of U. S. Congress. He died Aug. 2, 1849.

Henry W. Longfellow,⁶ son of the above, born at Portland, Feb. 27, 1807, gr. Bowd. Coll. 1825. Prof. at Bowdoin and at Harvard. Poet. Resides at Cambridge.

Sewall,* and this land was part of the estate which she received from her father, and is now occupied by Mr. Joseph Longfellow, a lineal descendant.

Byfield factory, probably the site of the first cotton mill in the country, was then visited. At this place, about 1790, Jacob Perkins, the well known inventor (born at Newburyport, July 9, 1766, died at London, July 30, 1849), put up a small mill and first demonstrated the practical working of his machine for cutting and heading nails at one operation. This invention, though, it is said, not a pecuniary success to the inventor, has since its introduction completely revolutionized the mode of manufacturing nails. Here Paul Moody in his youth found valuable instruction and satisfactory employment, and laid the foundation of a brilliant career as a mechanic, and whose name will be always identified with the introduction of manufacturing industries in Waltham and Lowell. A mile further on was noticed, shaded by elms, the residence of the second minister of the

* Children of Henry Sewall:—

1. *Hannah*, born at Tamworth, May 10, 1649; m. Jacob Tappan of Newbury, Aug. 24, 1670; d. Nov. 12, 1699.

2. *Samuel*, b. Bishopstoke, Hants, March 28, 1652; gr. Harv. Coll. 1671; m. Feb., 1675-6, Hannah, daughter of John Hull of Boston, Judge Sup. Court, Mass., and Ch. Justice; d. Jan. 1, 1729-30.

3. *John*, b. at Baddersly, Hampshire, Eng., Oct. 10, 1654; came to New England in 1661; m. Hannah Fessenden of Cambridge, Oct. 27, 1674; lived with his father at Newbury, and there died before him, Aug. 8, 1690.

4. *Stephen*, b. at Baddersly, Aug. 19, 1657; m. Margaret, dau. of Rev. Jona. Mitchell of Cambridge, June 13, 1682; resided at Salem, where he was Register of Deeds for Essex, etc.; d. Oct. 17, 1725.

5. *Jane*, b. at Baddersly, Oct. 25, 1659; m. Moses Gerrish of Newbury, Sept. 24, 1677; d. Jan. 29, 1716-17.

6. *Ann*, b. at Newbury, N. E., Sept. 3, 1663; m. 1678, William Longfellow, who was drowned Oct., 1690; she had for a second husband Henry Short of Newbury, and died Dec. 18, 1706.

7. *Mehitable*, b. at Newbury, May 8, 1665; m. William Moody of Newbury; d. Aug. 8, 1702.

8. *Dorothy*, b. at Newbury, Oct. 29, 1668; m. 1st, Ezekiel Northend of Rowley, Sept. 10, 1691; 2nd, Dec. 23, 1722, Moses Bradstreet of Rowley, whose widow she died June 17, 1751.

parish, Rev. Moses Parsons, from June 21, 1744, when he was ordained, until his death, Dec. 11, 1783. In this house was born, Feb. 24, 1750, his son Theophilus Parsons, the eminent jurist, Chief Justice of the Supreme Court of Massachusetts from 1806 until his decease, Oct. 30, 1813. The house was built, probably, in 1706.

About noon the party arrived at Dummer Academy, which is situated in a retired and shady spot at the intersection of several roads. This school was organized, in accordance with the will of its patron and founder, in 1763, during the provincial period of our history, under the direction of Samuel Moody,⁴ the first Principal. Mr. Moody had previously been so successful as a teacher in his native town, York, Me., that twenty-eight pupils were present at the opening. For many years the number of scholars averaged over seventy, and it is inscribed upon his tombstone:—"He left no child to mourn his sudden death (for he died a bachelor), yet his numerous

⁴William Moody,¹ probably the ancestor of all the Moodys in this section of the country, came in 1634 (it was said a saddler) from Ipswich, Co. of Suffolk. He was first of Ipswich, afterwards in 1635 of Newbury, where he continued to reside. He died Oct. 25, 1673. He had three sons.

1. Rev. Joshua Moody,² Harv. Coll., 1653, of Portsmouth and Boston; died July 4, 1697.

2. Caleb Moody,³ married 1st, Sarah Peirce; 2nd, Judith Bradbury. He died Aug. 25, 1698.

Rev. Samuel Moody,³ son of the above Caleb, b. Jan. 4, 1678; Harv. Coll. 1697; of York Me.; died Nov. 13, 1747.

Rev. Joseph Moody,⁴ son of Rev. Samuel, born in 1700; Harv. Coll. 1718; died Mar. 20, 1753, of York, Me.

Rev. Samuel Moody,⁵ the preceptor of Dummer, son of the above Rev. Joseph.

3. Samuel Moody,³ married Mary Cutting Nov. 9, 1657; died April 4, 1675.

William Moody,³ son of Samuel above, born June 20, 1663; married Mehitable Sewall Nov. 15, 1684 (see note on page 116); resided in Byfield; died Feb. 6, 1729-30.

Deacon Samuel Moody⁴ of Newbury, son of the above William and Mehitable, born March 21, 1689; died May 25, 1767.

Paul Moody⁵ of Newbury, son of the above Samuel, d. Dec. 30, 1823, aged 80; his widow Mary, d. March 10, 1825, aged 83.

Paul Moody⁶ the distinguished mechanic, son of the above Paul and Mary, b. at Newbury, May 23, 1779; died at Lowell, July 7, 1831.

pupils in the United States will ever retain a lively sense of the sociability, industry, integrity and piety, he possessed in an uncommon degree; as well as the disinterested, zealous, faithful and useful manner in which he discharged the duties of the Academy for thirty years. He died at Exeter, Dec. 14, 1795, aged seventy."

The school was not in session. Tables were spread on the green in front, beneath the trees, and a refreshing lunch was soon prepared.

At 2.30 P. M. the afternoon session was held in the study room of the Academy. The PRESIDENT in the chair.

The records of preceding meeting read.

The SECRETARY announced the following correspondence :—

From W. P. Andrews, May 15; D. M. Balch, May 15; Bureau of Education, Washington, June 23; E. P. Boon, New York, June 13, 28; Cornell University, June 28; Henry B. Dawson, Morrisania, N. Y., June 23; David B. Gould, May 31; Laighton & Brothers, Isle of Shoals, June 10; Charles Lawrence, Danvers, June 26; Joel Munsell, Albany, N. Y., June 22; W. D. Northend, June 24; C. L. Peirson, Boston, June; John Robinson, May 11; M. C. D. Slisbee, Boston, June; J. H. Stevens, June 26; James Upton, June 3, James S. Williams, May 27; Naturforschende Gesellschaft, Danrig, May 10; Historical Society of Pennsylvania, Philadelphia, May 19; K. K. Zoologische-botanische Gesellschaft.

The following additions to the library were reported :—

By Donation.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. Proceedings, at Hartford, Conn., Aug., 1874. 1 vol. 8vo.

BOLLES, E. C. Theological Discussion. 1 vol. 12mo. The School. 1 vol. 12mo. Celestial Scenery. 1 vol. 12mo. The Ladies' Repository from 1839 to 1866.

BOLTON, H. CARRINGTON, of Columbia Coll., N. Y. Centennial of Chemistry, Aug. 1, 1874, at Northumberland, Pa. 4to pamph.

BUREAU OF EDUCATION, Washington. Circulars of Information, Nos. 1, 2, 1875.

CABOT, MRS. J. S. Transactions of the American Pomological Society for 1860. 1 vol. 8vo. Agriculture of Mass. 1857. 1 vol. 8vo. Miscellaneous pamphlets, 72.

CLEVELAND, MRS. W. S. Six Plans drawn by Jona. P. Saunders in 1837, of Aca-pulco Harbour, Coast of Africa. Low and Society Islands. Cathburts Bay, Is. of Tootolllo, Navigators Group. Sandwich Islands. Marquesas, or Washington Islands. Galapagos Islands.

DALLETT, GILLIES. Philadelphia Directories, 1844, 1847, 1849, 1851, 1852, 1853, 1855, 1857, 1861, 1862, 1863, 1864, 1870, 1871.

GOULD, DAVID B., of St. Louis, Mo. Directory of St. Louis, for years 1871, 1872, 1873, 1874, 1875. 5 vols. 8vo.

GREEN, S. A., of Boston. Boston Municipal Register, 1873. 1 vol. 8vo. Miscellaneous pamphlets, 25.

LAWRENCE, CHAS., of Danvers, Mass. Moore's View in France, 2 vols. Fitzosborne's Letters, 1 vol. Gisborne on Christian Religion, 1 vol. Life and Labors of Dr. Worcester, 2 vols. Heydone's Tour, 2 vols. Life of Washington, 5 vols. Franklin's Sermons, 3 vols. Chalmer's Sermons, 1 vol. View in Italy, 1 vol. Life of P. Henry, 1 vol. Siege of Valencia, 1 vol. Notes on Travel, 1 vol. Sacred Biography, 3 vols. History of the Sandwich Islands, 1 vol. Garden Directory, 1 vol. Chapter on Flowers, 1 vol. Diseases of Animals, 1 vol. Barton's Poems, 1 vol. Mavor's Voyages, 17 vols. Book of Fruits, 1 vol. Treatise on Bees, 1 vol. Complete Farmer, 1 vol. Manual for Farmers, 1 vol. Memoir of Mrs. Hemans, 1 vol. Memoir of S. Green, 1 vol. Duffel's Dictionary, 3 vols.

LEE, JOHN C. Commercial Bulletin, May 8, 15, 22, 29, June 5, 12, 19, 1875.

LORING, GEO. B. Agriculture of Mass.; by C. L. Flint. 1874-5. 1 vol. 8vo. Thirty-second Registration Report of Mass. 1 vol. 8vo. Sixth Annual Report of Mass. State Board of Health. 1 vol. 8vo. Eleventh Annual Report of Mass. State Board of Charities. 1 vol. 8vo. Sixth Annual Report of Mass. Board of Railroad Commissioners. 1 vol. 8vo.

MASS. HORTICULTURAL SOCIETY. Transactions of, for 1875. Part I.

MERRIAM, G. & C., of Springfield, Mass. Webster's Unabridged Dictionary. 1 vol. Royal 4to. 1875.

OFFICE OF THE CHIEF OF ENGINEERS. Report upon the Reconnaissance of Northwestern Wyoming, 1873, by W. A. Jones.

OSGOOD, CHAS. S. Legislative Documents for 1875. 4 vols. 8vo.

PHILA. ZOOLOGICAL SOCIETY. Third Annual Report. 1875. 8vo pamph.

PUTNAM, F. W. Archaeological Researches in Kentucky and Indiana. 1874. 8vo.

RABARDY, J. F. Manchester, Mass. The Beetle and Wedge. Feb. to June, 1875.

STONE, E. M., of Providence, R. I. Thirty-third Annual Report of the Ministry at Large. 1875. 8vo pamphlet.

STONE, MRS. J. H. Masonic Monthly, 15 Nos. American Homes, 11 Nos. Hunt's Merchant Magazine, 55 Nos. Yankee Farmer, 1838, 1839, 1840, 1841. Miscellaneous pamphlets, 10.

U. S. PATENT OFFICE. Official Gazette for Apr. 20, 27. May 4, 11, 18, 25, 1875.

WILLIAMS, B. W. Lecture Bureau for 1875-6. 8vo pamph.

YOUNG MEN'S ASSOCIATION OF BUFFALO. Thirty-ninth Annual Report. 8vo.

By Exchange.

ACADEMIE ROYALE DES SCIENCES, DES LETTRES ET DES BEAUX-ARTS DE BELGIQUE. Bulletins. Tome xxxv, xxxvi, xxxvii. 1873-4. 3 vols. Annuaire, 1874.

AMERICAN ACADEMY OF ARTS AND SCIENCES. Proceedings. Vol. II. May, 1874, May, 1875.

AMERICAN PHILOSOPHICAL SOCIETY. Proceedings. Vol. XIV. Jan., June, 1875.

AMHERST COLLEGE. Catalogue of Officers and Students for 1874-5. 8vo pamph.

BOSTON SOCIETY OF NATURAL HISTORY. Proceedings, xiv to xvii. Memoirs, Vol. 2, pts. 1, 2, 3, and No. 1 of pt. IV.

BUFFALO SOCIETY OF NATURAL SCIENCES. Bulletin of. Vol. II, No. 4.

CROSSE ET FISCHER. Journal de Conchyliologie. Tome xv. 3e Série, No. I, 1875.

ENTOMOLOGISCHE ZEITUNG, STETTIN. Vol. for 1874. 1 vol. 12mo.

GEOLOGICAL SURVEY OF INDIA. Memoirs of. Vol. x, pt. 2, 1873. Vol. xi, pt. 1, 1874. Records of. Vol. vii, pt. 1-4, 1874. Palaeontologia India. Vol. I, pt. I, 1874.

- INSTITUT HISTORIQUE. L'Investigateur. Dec., 1874. Jan., Feb., 1875, 8vo.
 INSTITUT NATIONAL GENEVOIS. Bulletin, Tome xx. 1875.
 K. K. ZOOLOGISCH-BOTANISCHEN GESELLSCHAFT IN WIEN. Verhandlungen, Band xxiv, 1874. 1 vol.
 KÖNIGLICHE GESELLSCHAFT DER WISSENSCHAFTEN GOTTINGEN. Nachrichten. 1874. 1 vol. 12mo.
 MASS. HISTORICAL SOCIETY. Proceedings. 1873-1875. 1 vol., 8vo.
 NATURFORSCHENDE GESELLSCHAFT, GOILITZ. Abhandlungen, Band xv, 1875.
 NEW YORK LYCEUM OF NATURAL HISTORY. Annals. Vol. XI. Nos. 3, 4.
 SOCIÉTÉ D'ACCLIMATATION, PARIS. Bulletin Mensuel. Tome I, 3me Serie. Nov., Dec., 1874. Tome II, 3me Serie. Jan., 1875. 3 pamphlets, 8vo.
 SOCIÉTÉ D'ANTHROPOLOGIE, PARIS. Bulletins, Apr., June. 1874.
 SOCIÉTÉ DES SCIENCES NATURELLES DU GRAND-DUCHÉ DE LUXEMBOURG. Publications, Tome XIV. 1874. Observations Meteorologiques faites à Luxembourg. Deuxieme vol. 1874.
 SOCIÉTÉ VAUDOISE DES SCIENCES NATURELLES, LAUSANNE. Bulletin. Vol. xiii, No. 73. Dec., 1874.
 VEREIN ZUR BEFÖRDERUNG DES GARTENBAUES BERLIN. Monatsschrift, Jahrg. xvii, 1874.
 ZEITSCHRIFT FÜR DIE NATURWISSENSCHAFTEN IN BERLIN. July to Dec., 1874.
 ZOOLOGISCHE GESELLSCHAFT, FRANKFURT. Zool. Garten. Vol. XV. No. 7-12.
 PUBLISHERS. American Journal of Education. American Journal of Science and Arts. American Naturalist. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Sailor's Magazine. Salem Gazette. Salem Observer. Salem Register. Salem Post. The European Mail. The Owl. Turner's Public Spirit.

The PRESIDENT then made a few preliminary remarks, describing the excursion from Newburyport to this place, and the historical localities visited. He also gave a brief biographical sketch of the Sewall family, on whose ancient domain at the factory they made a halt. He called upon Hon. William D. Northend of Salem, who was born in Byfield, and there had spent his early years, to give some account of Byfield, of Dummer Academy, the founder, the teachers and the alumni.

Hon. WILLIAM D. NORTHEND, in response, gave a very interesting sketch of Byfield and Dummer Academy. He remarked that the parish is a religious one, and at no time during the last century has it numbered over one hundred families; probably no place of its size, in the United States, can present such a record of notable men. Regarding them and the Academy he said:

Richard Dummer of Bishopstoke, Hants, England, son of John, born there in 1599, came to New England in 1632, and was among the first settlers in Newbury. He afterwards went to England, but returned in 1638 with his brothers Stephen and Thomas. He prospered and became a man of great wealth, and owned much land in this parish, including the grounds which this Academy now occupies; his sons Jeremiah, Richard, and Rev. Shubael held prominent positions in society; he died Dec. 14, 1679. His grandson, Jeremy Dummer, son of Jeremiah, was the agent of the colonies in England from 1710 to 1721, and advocated their claims with great ability. He is well known as the author of "a defence of New England Charters;" and a "letter concerning the expedition to Canada." He died May 19, 1739, aged 60.

Another grandson, a brother of Jeremy, William Dummer, was Lieut. Governor of the colony, and for a time was acting Governor; his administration was a wise one, and he was much respected by the people. His wife was Catherine, daughter of Gov. Joseph Dudley. He died *s. p.* 10 Oct., 1761, aged 84 years. This farm was his country seat, and the mansion to the right of the Academy was built by him after the old English style.

Henry Sewall, only son of Henry who followed him to New England, and died in Rowley, March, 1656-7, in the 81st year of his age, and grandson of Henry who was several times mayor of Coventry, was born in 1614, came to New England in 1634 plentifully supplied with money and English servants, neat cattle and provisions, and with other things suitable for the commencement of a plantation, removed to Newbury in 1635, where he became proprietor of a large tract of land known as the Highfields, at the Falls within this parish.

He married, March 25, 1646, Jane, eldest daughter of

Stephen Dummer. In 1646 he went to England, but returned in 1659, his family following in 1661, and resided in Newbury until his decease, which occurred May 16, 1700, at the age of 86 years. From this marriage came all the Sewalls in this part of the country. His son, Samuel Sewall, was Judge of the Supreme Court of the Massachusetts colony from 1692 to 1728, ten years of which he was Chief Justice; Stephen, son of his son Stephen, was Justice of the same court from 1739 to 1760, eight years of which he was Chief Justice; David, grandson of son John, was Justice of the same court from 1777 to 1790; Samuel, great-grandson of son Samuel, was Justice from 1800 to 1814, and the last year Chief Justice. Therefore from the descendants of Henry and Jane Sewall the Supreme Court of this state was furnished with Judges for eighty-two years, and Chief Justice nineteen years. It may be added that Judge David Sewall, named above, after his resignation was many years Judge of the U. S. District Court in Maine. Jonathan Sewall, likewise a nephew of Chief Justice Stephen, was Attorney General of Mass., 1767-75, and Jonathan and Stephen, sons of the above Jonathan, were respectively Chief Justice and Attorney General of the Province of Lower Canada. From the same family have been a large number of distinguished men of the clergy, especially in this state and Maine, and some in other professions of life. It is doubtful if any one family in the country has furnished a larger number of more distinguished men.

Henry Sewall, either by deed or bequest, gave these lands to three of his daughters; that portion adjoining the "Falls" to his daughter Mehitable, wife of William Moody. Many of the descendants of his grandfather, William Moody, the emigrant ancestor, were distin-

guished, among whom may be mentioned Paul Moody, the mechanician, who was one of the most influential persons in the building of the manufactories at Lowell, and Samuel Moody, the celebrated teacher of Dummer Academy. This estate has continued in the family until the present generation.

The portion known as "Highfields" was given to his daughter Anne, wife of William Longfellow. After his death she married Henry Short. She had children by both marriages. The Longfellows in the second generation purchased the share of the Shorts, and the farm was then divided between Stephen Longfellow and his sister Ann, who married Abraham Adams.⁵ A large part of the Longfellows' portion has been and is now owned by descendants of the name. Joseph Longfellow is the present owner of a portion of it. Abraham Adams' share is now owned by his descendants, divided, however, into several farms. From William Longfellow has descended a man whose name need only to be spoken, Henry W. Longfellow, the poet. His great-grandfather was born in the house which was visited by you this morning. He emigrated to Maine in 1745. Stephen, the grandfather of Henry W. Longfellow, was a Judge of the Court of Common Pleas, and his father, Stephen, was a distinguished lawyer and member of Congress.

The third portion of the estate was given to his daugh-

⁵Capt. Abraham Adams, b. May 2, 1676; pub. to Anne Longfellow Nov. 13, 1703; d. April 8, 1763. Ann, his wife, d. Feb. 4, 1758, aged 74 yrs., 11 mo. He was the son of Serg. Abraham Adams, b. in the year 1639; m. Nov. 10, 1670, Mary Pettingill. He died June 14, 1714, aged 75. His wife Mary died Sept. 19, 1705. A grandson of Robert Adams, who with his wife Eleanor came to Ipswich in 1635, thence to Salem, 1638, finally settled in Newbury in 1640. He died Oct. 12, 1682, aged 81. His wife Eleanor d. June 12, 1677. His second wife, Sara, widow of Henry Short, whose maiden name was Glover, to whom he was married Feb. 6, 1678, d. Oct. 24, 1697.

ter Jane, wife of Moses Gerrish,⁶ from whom was descended many persons of note. This portion of the original estate for the last two or three generations has been sold out of the family.

Other lands in Newbury were given to his daughter Dorothy Northend,⁷ and lands within the present limits of Newburyport to his daughter Hannah Tappan, probably where is now Tappan's lane. In this connection allusion has been made principally to the disposition of that portion of his estate lying in the parish of Byfield.

Mr. Northend then mentioned the names of several distinguished persons who were born, or had their residence, in this parish. The following may be specified.

Theophilus Parsons, the most distinguished jurist in Massachusetts; John S. Tenney, the late distinguished Chief Justice of the Supreme Court of Maine, was born in the Rowley part of this parish, as was also Samuel Tenney, a Judge of the Court of Common Pleas of New Hampshire; Samuel Webber, President of Harvard University; Prof. Eliphalet Pearson of Harvard and Andover, Prof. John Smith of Bangor Seminary, and Parker Cleaveland, the distinguished Professor at Bowdoin College, were all born within the limits of this parish. Here was also settled the distinguished political preacher, Rev. Dr. Elijah Parish, who in the war of 1812 fulminated against the acts of the General Government, and whose

⁶ Moses Gerrish, born May 9, 1656; m. Sept. 24, 1677, Jane Sewall; died Dec. 4, 1694, aged 38; resided in Newbury. His widow Jane d. Feb., 1716. He was a son of Capt. William Gerrish, who came from Bristol, England, about the year 1640, and settled at Newbury; m. April 17, 1645, Joanna, widow of John Oliver, and became the founder of a family which properly assumed a leading position in the colony. His brother Benjamin was a prominent citizen of Salem. See *Hist. Coll. Essex Inst.*, vol. II, page 213, and vol. V, page 25. His brother Joseph was the third pastor of a church in Wenham; b. at Newbury, March 23, 1650; ord. Jan. 13, 1675; d. Jan. 6, 1720.

⁷ For an account of the Northend Family see *Hist. Coll. Essex Inst.*, vol. XII, p. 71.

speeches were quoted in the famous discussions of Webster and Haynes.

[In addition to those of Byfield descent mentioned by Mr. Northend we would add the names of Rev. John P. Cleaveland, D. D., Hon. Albert Pike, the poet, lawyer, etc., of Little Rock, Ark., and Rev. Sewall Tenney, D. D., of Ellsworth, Me.

Mr. Charles Northend of New Britain, Conn., and Hon. William D. Northend of Salem, are lineal descendants of Ezekiel and Dorothy (Sewall) Northend, and many of the name of Tappan in New England are descendants of Jacob and Haannah (Sewall) Tappan.²—Eds.]

Dummer Academy was established by Gov. Dummer, who left for its endowment this farm of 400 acres, with the buildings upon the same. It first went into operation in 1763, and was the first institution of the kind in the state. The first teacher was the celebrated Samuel Moody, the Dr. Busby of America. Of those who attended his school, two were afterwards Presidents of colleges, nine were Professors, eleven were Judges of the Courts, nineteen were members of the House of Representatives at Washington, five were members of the U. S. Senate, one a member of the Cabinet, and one was minister to England.

Mr. Moody retired in 1790, and his successor was Rev. Isaac Smith, followed successively by Benjamin Allen, Rev. Abiel Abbott, Samuel Adams, Nehemiah Cleaveland and others. Among those who were under their tuition are enrolled many who have become eminent in the several professions and worthy members of society.

²Jacob Tappan, born in 1644; m. Hannah Sewall Aug. 24, 1670, who died Nov. 13, 1690. He d. Dec. 13, 1717. He was son of Abraham Tappan, who came to Newbury in 1637, m. Susanna Goodale of Yarmouth, Eng., who d. March 20, 1689. He died Nov. 5, 1672, aged 64.

It is a matter of regret that this institution, so well situated for the education of youth, should have suffered so much from neglect, and it is to be hoped that efforts will be made to place it again in the position it held in the past.

Dr. JEREMIAH SPOFFORD spoke of the character of Dummer Academy, which he had known for seventy-five years. He had the honor of Dr. Parish's acquaintance, and had met Dr. Cleaveland in council. The former was a most forcible speaker, and a bitter enemy to the Democratic party. The latter had greater education than many about him who had greater practice, but he was too dignified for his position.

Mr. FREDERICK W. PUTNAM gave an account of the few zoological specimens he had collected about the grounds of the Academy, and in a small neighboring brook. He specially described the structure of the galls on the wild rose, and described the insects by which they were made. He also exhibited a colony of Polyzoa, of a species quite abundant on the stones in the brook, and described their different stages of growth, which were so fully illustrated by Prof. Hyatt several years since, in the Proceedings of the Institute.

Mr. JOHN ROBINSON of Salem talked about the plants which he had collected, remarking that every one should know enough of botany to be able to distinguish the poisonous plants. Ivy and dogwood were the only ones in Essex County. With the latter he thought that few persons were acquainted. He then spoke of the fertilization of plants by insects, and made a few remarks on the growth of the fungi.

Mr. HAYDN BROWN of West Newbury said the influence of Dummer Academy is felt for miles around in the manners of the people. The past of the Academy was secure, but he doubted of the future. The days of private institutions were past, now that the state provides high schools of the same grade. He thought there were but few academies self-sustaining.

He then changed his subject and spoke of the insects that devour his crops. He thought that at least a quarter part of our crops of almost every kind was eaten up by these pests, and he suggested that the members of the Institute, and especially its naturalists, should turn their attention towards the discovery of some mode for the extermination of the insect pests.

The PRESIDENT said that it would facilitate Mr. Brown's crusade on noxious insects if local museums were established, and children become interested in collecting specimens, and studying the habits of the various plants and animals that are continually met with.

AMOS NOYES, Esq., of Newburyport, considered the fact referred to by Mr. Brown, that academies were declining, was a sign of progress. We had outgrown them and they could not and should not compete with state schools.

Rev. Dr. SAMUEL J. SPALDING of Newburyport, spoke of the Byfield Academy, which grew out of Dummer, and which sent out many eminent teachers, whose influence still pervade the schools of the country. He thought that private institutions were not in their decadence. Athens had no schools, but the responsibility of education was thrown on individuals, and what sages she pro-

duced. The state cannot do everything, as some would have it, regulate our meat and drink and hours of labor. Dummer Academy had lately adopted an improving element in the admission of girls, and there were no public institutions to-day for young ladies so good as private ones.

Dr. JEREMIAH SPOFFORD agreed with the last speaker that all the business of education should not be done by the state.

Messrs. PUTNAM and BROWN here reopened the question of injurious insects. Mr. Putnam said that science was equal to the destruction of many kinds of insects that prey on the crops of the farmer, and if farmers would only work together they could exterminate their insect enemies. For instance, printer's ink is a sure exterminator of the canker worm. Printer's ink has exterminated many evils, and here was one more it could cope with, if all the farmers in a given section would apply it to their trees. Here was one case at least where the state should interfere and make a law requiring every man to assist in abating the canker worm nuisance who had a tree liable to be attacked by these insects.

Mr. BROWN replied that he could take care of the canker worm and caterpillar, but he would give a gold medal to the man who would eradicate other insects which infest his farm.

On motion of Mr. PUTNAM :

Voted, That the thanks of the Institute be tendered to Mr. and Mrs. Ebenezer G. Parsons, the Principals of the Academy, for their courtesy and kindness so generously extended to the party during the day.

Adjourned.

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BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 7. SALEM, MASS., SEPT. AND OCT., 1875. Nos. 9 & 10.

One Dollar a Year in Advance. Ten Cents a Single Copy.

REGULAR MEETING, WEDNESDAY, JULY 7, 1875.

THIS was an adjournment of the meeting held on Monday, July 5. PRESIDENT in the chair.

Mention was made that several members of the Institute and their friends chartered the new, safe, and commodious steamer "Governor Andrew," for an excursion which took place on Monday, June 14, from Salem harbor along the eastern coast to the Isles of Shoals, with a view to deep sea dredging and the collection of specimens of the marine fauna and flora of that group of Isles.

The steamer "Governor Andrew" is a new boat, built last year for the Boston and Hingham line, and is finely modelled and furnished, making one of the best excursion steamers in the waters of Massachusetts Bay. The weather was pleasant; the sail along the shore was very enjoyable, and the familiar scenery of the rock-bound and wooded coast, dotted here and there with the residences of the summer visitors, never looked more attrac-

tive. The boat stopped at Gloucester and took on board some twenty-five or thirty more of the party, and from there sailed direct to the islands, arriving about noon. The party landed at "Star Island," and was hospitably received by the proprietor, John A. Poor, Esq. Some two hours were pleasantly and profitably spent in examining the peculiar geological features, the fauna and the flora. The student in history also found much of interest. The monument erected to the memory of Capt. John Smith, recalled the scenes incident in the first part of the 17th century, when these islands were visited by Champlain, John Smith, and others of those early voyagers who navigated these seas before the landing of the Pilgrims at Plymouth. The old stone church, with the adjoining burial ground in the stony soil, and its many graves marked by rude stones, two of which were prominent, one in commemoration of Rev. John Tucke, A. M., died Aug. 12, 1773, aged 72, the other in memory of Rev. Josiah Stevens, died July 2, 1804, aged 64 (two of the old divines who Sunday after Sunday were wont to minister at the sacred desk to these people), marked another period in the history of these isles when in the occupancy of the hardy fishermen. Times have changed greatly within the last quarter of a century, and now they have become fashionable watering places, and on two of them, "Appledore" and "Star," have been erected large and commodious hotels, that are thronged with visitors during the heated term.

In recognition of the civilities and courtesies extended to the party during this excursion to the Isles of Shoals, it was, on motion of Mr. JOHN ROBINSON :

Voted, That the cordial thanks of the members and friends of the Essex Institute who participated in the

recent excursion to the Isles of Shoals are hereby presented to John A. Poor, Esq., of the "Oceanic" on Star Island, for his kindness in inviting the party to land at the island, and also for his various acts of courtesy shown to the excursionists during their stay.

Messrs. John M. Hagar of Salem and C. W. Kempton of Newburyport, were elected resident members.

Adjourned.



FIELD MEETING AT CONCORD, TUESDAY, JULY 27, 1875.

THE third field meeting of the present season was held at Concord, this day, having been postponed from Friday on account of the rain. More than two hundred and fifty persons attended from Salem and vicinity, the unusually large number, eager to proceed to such an unwonted distance, evinced a lively continuation of the patriotic interest in this historic old town inspired by the events of the 19th of April, 1775, and freshly awakened by the commemoration of the present year.

An unfortunate delay in the arrival of the Bangor train at Salem diminished even the limited time of the stay at Concord, but the misfortune was partially remedied by the promptness of the Fitchburg Railroad officials in furnishing a special train to the excursionists immediately upon their arrival in Boston.

On reaching Concord the company rendezvoused at the elegant and unique Public Library building, the noble gift to the town from one of its citizens, Mr. William Munroe. It stands on a triangular plat at the junction of two streets and is a successful adaptation of the picturesque features of mediæval architecture to the requirements and mode of construction of the present day.

This place, with its collections, is worthy of a more thorough examination than the party was enabled to bestow. Here may be seen the busts of Plato, Agassiz, Emerson, Mann, Hawthorne, Brown, and Munroe, as well as several valuable historical relics. One alcove is devoted to the printed works of Concord authors from the settlement of the town to the present time.

From this point the company proceeded in groups to visit the various memorable places of this delightful old town. The citizens generally seemed to have put at the disposal of the visitors all their private vehicles, and themselves acted as guides and expositors. There was an outpouring of genial hospitality from first to last, that was thoroughly characteristic of the Concord people. Gentlemen of the highest reputation in State affairs and in literature devoted themselves to the entertainment of the strangers with an impartiality, earnestness, cordiality and assiduity which it was refreshing to witness, and the town officers united with the citizens generally to make the visit agreeable.

The first objective point was the old North Bridge, with its impressive surroundings, but we will not repeat the story so often rehearsed within the last few months. The newly erected statue of the minute man, designed by Daniel French, a young Concord artist, now in Italy, in Powers' studio, excited universal admiration, and is really one of the finest works in the country. An enhancement of the pleasure of those who were examining this sacred spot, and who could not help recalling the oft-repeated stanza :—

“By the rude bridge that arched the flood,
 Their flag to April's breeze unfurled,
 Here once the embattled farmers stood,
 And fired the shot heard round the world:”

was the fact of the presence of the author of the immortal poem of which this verse forms a part. Here also at the bridge, marked by a rude headstone, lie the remains of British officers killed in action, and near by stands the monument erected some time since in honor of the American soldiers engaged in the Concord fight.

Several of the visitors found delightful recreation on Concord River in the neat and convenient pleasure boats which were freely placed at the disposal of the party. Messrs. Morse, Putnam and Bolles visited a shellheap some two miles up the river, obtaining interesting specimens of Indian relics.

Among the places interesting to Salem people, because of their connection with their townsman, Hawthorne, was the old Manse, which is in the near vicinity of the North Bridge. Here Hawthorne resided for several years. Now, as he described it long ago, between two tall gateposts of rough-hewn stone, we behold the gray front of the old parsonage, terminating the vista of an avenue of black ash trees. It was built by the grandfather of Ralph Waldo Emerson, and its last inhabitant before Hawthorne occupied it was the venerable Parson Ripley, who had died about a twelvemonth before. It was from the study window facing the river that the clergyman, who then dwelt in the manse, stood watching the outbreak of a long and deadly struggle between two nations; he saw the irregular array of his parishioners on the farther side of the river, and the glittering line of the British on the hither bank; he awaited, in an agony of suspense, the rattling of the musketry. It came; and there needed but a gentle wind to sweep the battle smoke around this quiet house. Hawthorne says that the old manse had never been profaned by a lay occupant, until that memorable summer afternoon when he entered it as his home, in 1842. A

priest had built it; a priest had succeeded to it; other priestly men had, from time to time, dwelt in it; and children born in its chambers, had grown up to assume the priestly character. The latest inhabitant alone had penned in it nearly three thousand discourses, besides the better, if not the greater number, that had flowed living from his lips. Here Emerson wrote "Nature," and here Hawthorne sojourned, sending forth his "Mosses from the Old Manse" with the declaration:

"For myself the book will always retain one charm, as reminding me of the river, with its delightful solitudes, and of the avenue, the garden and the orchard, and especially the dear Old Manse, with the little study on its western side, and the sunshine glimmering through the willow branches, while I wrote."

The Old Manse is now the residence of Judge Ripley, who gave the visitors a kindly welcome.

We must pass over the visits to other places connected with the memory of Hawthorne, his later residence, his walk on the Ridge Path; and his grave; the home and haunts of Thoreau, the poet-naturalist, whose favorite Walden Pond, around whose borders he studied nature so closely and of which he wrote so delightfully, was passed on the way, and was the scene of a gay picnic party, who probably little thought of the man who had so often wandered on its former quiet banks; and of the many other objects of interest, which crowded a day which will be remembered with delight.

The dinner was spread in the vestry of the First Church, and here the ladies of Concord took the entire charge of the preparations, with a lavishness altogether opposed to the simple requirements of the Institute. The Concord ladies added largely to the ordinary refreshments, laid and decked the tables in a refreshing and

tempting style, while many of the younger portion constituted themselves fair waiting maids, and dispensed the viands with a grace and dexterity that added charm to the feast.

The afternoon session was held in the Town Hall, and was attended by a large audience, including Judge E. R. Hoar, Ralph Waldo Emerson, the venerable A. Bronson Alcott, Wm. W. Wheildon, and many others, including Concord's wisest and best and fairest citizens.

The PRESIDENT of the Institute called to order, and in his introductory remarks stated that this was the fourth field meeting held beyond the limits of Essex county; of these, one was at Wakefield, and another at Reading; as those towns were settled by Lynn people and were known as Lynn village, they probably at one period may have been considered as a part of Essex county, until the lines between Essex and Middlesex were adjusted. The third was at Kittery, Me., the residence of Sir William Pepperell, who was connected by marriage with some of our old Salem families. It was appropriate that the Institute should visit Concord, for several reasons. In the first place, to see the grave of a distinguished son of Salem, which is marked by two small, white marble stones, with the simple inscription "Hawthorne," of whose ancestry and birthplace a brief sketch was then given.¹

Secondly, it was fitting for the association to visit the town to which the Legislature adjourned from Salem in October, 1774, after having resolved itself into a Provincial Congress and assumed the powers of sovereignty, which event was duly commemorated by the Essex Insti-

¹ See Bulletin of Essex Institute, vol. 3, page 25, for a communication on "The Ancestry and Birthplace of Hawthorne."

tute, with an address from A. C. Goodell, Jr., Esq., on the 5th of October last, at the Institute rooms.³

The President next alluded to Concord as the home of Thoreau,³ the poet-naturalist, who had done so much to make us acquainted with the fauna and flora of Concord by his writings. It is, likewise, the place where was originated some two hundred years ago the famous Hunt's russet apple;⁴ and also, more recently, the widely known Concord grape so extensively and generally cultivated.

The President closed his remarks by briefly sketching the history and objects of the Institute, which is the usual custom at meetings held in a new locality.

Judge E. R. HOAR then came forward, and in behalf of his townsmen gave the members of the Institute a cordial welcome to Concord. He felt he but expressed the feelings of the people of the town when he said he was very glad to see them. The Judge continued in a humorous strain which elicited much laughter and applause. He alluded to their researches on and around the sluggish river, and to Hawthorne's declaration that it was the only river he ever knew that was too lazy to keep itself clean. His father, the Judge said, had a different idea. He thought the river hated to leave Concord! In illustration of the ignorance of many people on the sub-

³ For an account and the address see Bulletin of Essex Institute, Vol. 6, page 166. The address is printed in full in the Historical Collections of the Essex Institute, vol. xiii, page 1.

³ Henry David Thoreau, b. July 12, 1817, gr. Harv. Univ. 1837, d. May 6, 1862, dedicated his genius with such entire love to the fields, hills and waters of this town that he made them known and interesting to the reading public. The river on whose banks he lived, he knew from its springs to its confluence with the Merrimack.

⁴ The Hunt russet apple, a good and desirable variety, is said to have originated on the Hunt farm, in Concord, located about one mile north of the village, on the south side of "Puntakasset" Hill, overlooking the old North Bridge of Revolutionary fame.

ject of natural history, he repeated a story told to him by Thomas Hughes, author of "School-days at Rugby," "Tom Brown at Oxford," and other popular books, when he was visiting at Concord. It was at the expense of one of the railroad guards of an English train. A lady in the same carriage with him had a pet rabbit, and the guard protested that the passenger car was not a proper place for it; whereupon a gentleman drew from his pocket a turtle, saying that he, the guard, would not think of ejecting that, and that the rabbit had as much right there as the turtle. The guard went to headquarters to determine the question, and returning said, "cats is dogs, and rabbits is dogs, and they must go in the baggage van; but turtles is insects, and they go free; and rabbits must pay." The Judge remarked that that was the only lesson that he ever received in natural history. He also alluded to the rivalry between the North Bridge at Salem and that at Concord, and claimed that the latter had at least the substantial fact of the graves of two British soldiers killed there. He further referred to Hawthorne, spoke of the important objects of the Institute, and concluded, as he began, by saying that he was glad to welcome the members to Concord.

PROF. E. S. MORSE was called upon for an account of his trip on the river. He said he had found plenty of heat, but very little else, as his time on the river had been very limited. He had been thinking what he should take for a subject, if called upon to make any remarks, and Judge Hoar's story of the tortoise had suggested the subject of turtles. It was astonishing to an Englishman to see the great number of turtles in this country; in England they are very rare. He proceeded to speak of the similarity between the embryos of turtles and those

of birds. No two families of vertebrates seemed to be more widely dissimilar in their development, yet there was a similarity almost amounting to identity in their embryonic forms. He illustrated this fact, and the gradual changes which result in the differences between them when they emerge from the eggs, by drawings on the blackboard, and briefly alluded to the points of similarity which are evident to a naturalist. To further illustrate this similarity he described a fossil skeleton found in Germany, which combined the wings and feathers of the bird with the vertebral development and teeth of the reptile. In closing, he alluded with great respect and admiration to the labors of Thoreau in Concord, to which the naturalists of the vicinity owe so much, and during further remarks announced himself a believer in the theory of Darwin.

Vice President F. W. PUTNAM gave an interesting account of his visit to the Indian shellheap on the river, from which Thoreau made the valuable collection of relics, now under his own charge at the archaeological Museum at Cambridge. He was glad to have seen the place where Thoreau and Wyman had collected the relics alluded to. He also exhibited and commented upon about a dozen stone implements, of the shape of arrowheads, which had been picked up there, some of which were evidently intended for knives rather than arrow or spearheads, and gave a general account of the composition and formation of the shellheaps found on both coasts of America, on many of our river banks, and in nearly all other parts of the world.

Prof. MORSE, in answer to a question from Mr. Wheldon, explained how the ballooning spiders were suspended in the air.

Rev. E. C. BOLLES, of Salem, in some eloquent remarks, spoke of the microscopic forms of life to be found in Concord River, illustrating upon the blackboard, and explaining some of the wonders of the simplest forms and modes of growth of animal life.

Judge HOAR called attention to the importance of accurate observation, and to the difference between the observer of facts and mere theorists, illustrating his point by a pertinent law case which once came before him. It was the trial of a man for robbery. A farm house had been entered in the night, the door of the sleeping room secured so that the occupants could not get out, a lamp lit, and a desk rifled of quite a large sum of money. Suspicion rested on a man who had formerly worked on the farm, and it was brought out in evidence that at about that time he was seen to have a good deal of money, and the tracks about the farm house, the morning after the robbery, were made by a shoe the size of his, but all the evidence was circumstantial, and Judge Hoar on the bench and the jury in their box all thought that the government would fail to convict the prisoner. At last the government attorney called a neighbor who had visited the house on the morning after the larceny, and asked him if he found anything upon the floor of the room where the lamp had been lit. Yes, he had found a match about half burnt, evidently thrown down by the person who lit the lamp. Turning to the officer who arrested the prisoner, he enquired what he had found on his person when arrested, and among other things the officer produced half a card of matches. Taking the burnt match found upon the floor, and the half card found upon the prisoner, the government attorney showed the court and jury that the burnt match had manifestly been split from the card

in the prisoner's possession, as they fitted so exactly, and the grain of the wood ran in such a manner that there could be no doubt whatever in regard to the matter, and the man was found guilty of the robbery.

The Rev. GRINDALL REYNOLDS of Concord, alluded to some of the historic facts of the Revolution and of the similarity of events at the North Bridge in Concord, and the North Bridge in Salem. He also spoke of the value of such gatherings as the present, in the diffusion of knowledge combined with the pleasures of a summer's day picnic.

Prof. D. B. HAGAR, of Salem, after some highly complimentary remarks on the reception given by citizens of Concord to the Institute party, which were endorsed by the President and the entire company of visitors, offered the following resolutions, which were unanimously adopted :—

Resolved, That the hearty thanks of the Essex Institute are hereby presented to the selectmen of Concord, for the courteous invitation extended to the Institute to meet in this place, and for the free use of their Town Hall ; to the authorities of the First Church for the accommodations kindly afforded by them ; and to the ladies and gentlemen of Concord who have contributed so hospitably and abundantly to the entertainment of the Institute. .

Resolved, That the Institute will hold in grateful remembrance the field meeting at Concord as one of the most delightful and profitable in all its history.

Resolved, That the thanks of the Institute are due to the officers of the Eastern and the Boston & Lowell Railroads for kind attentions, and to C. L. Heywood and John Adams of the Fitchburg Railroad, for their readiness in furnishing a special train for the party to Concord and for other courtesies.

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At half-past five the meeting was closed and the company returned to Boston over the Lexington branch and Lowell roads, reaching Salem about eight o'clock, after one of the most interesting and delightful excursions ever participated in by the Institute.

Adjourned.

REGULAR MEETING, MONDAY, AUGUST 2, 1875.

Regular meeting this evening. The **PRESIDENT** in the chair. Records read.

The **SECRETARY** announced the following correspondence :—

From S. P. Boynton, Lynn, July 21; Boston Soc. Nat. Hist., July 17; Buffalo Hist. Soc., July 12; John J. Babson, Gloucester, July 9; Edward Cogan, Brooklyn, N. Y.; Concord, Selectmen of, July 12, 19, 23; Globe Publishing Co., Boston, July 19; Henry M. Greenough, Newburyport, July 7; D. B. Hagar, July 15; Charles W. Kempton, Newburyport, July 8; Kjobenhavn, K. Danske Videnskab. Selskab, June 29; Lowell Bleachery, July 9; New Jersey Hist. Soc., July 13; New York Hist. Soc., July 12; Ohio Hist. and Phil. Soc., July 13; Abner J. Phipps, Boston, July 3; John R. Poor, Boston, July 29; G. Reynolds, Concord, July 17; Royal Polytechnic Soc., Cornwall, July 12; Rhode Island Hist. Soc., July 12; Royal Soc. of Tasmania, July 23, 1874.

The **LIBRARIAN** reported the following additions :—

By Donation.

DUDLEY, DEAN. Directories :— Plymouth and Barnstable Counties, 1873-4; Hyde Park, Dedham and Canton, 1874; Quincy, Weymouth and Braintree, 1873-4; Cambridge, 1872; Brookline, Jamaica Plain and West Roxbury, 1873-4, 1 vol.; Concord, 1874-5; Dover, Great Falls and Rochester, 1874; Beverly, Peabody and Marblehead, 1875.

FEARING, A. G., of Boston. Programmes, etc., of the Bunker Hill Monument Association, June 17, 1875.

FOLGER, W. C., of Nantucket. Miscellaneous Town Reports, 10.

GATES, GEO. S., Groton. Catalogue of the Groton Public Library.

GREEN, S. A., Boston. Miscellaneous pamphlets, 21.

HARTMANFT, J. F., of Philadelphia, Penn. Pennsylvania Archives, Second Series, Vol. I, 1874.

KIMBALL, JAMES. Cape Ann Advertiser, May to July. Proceedings of the Mass. Council of Deliberation held in Boston, June 30, 1874. 8vo pamph.

MUNSELL, JOEL, Albany, N. Y. Miscellaneous pamphlets, 31.

PUTNAM, F. W. Geological Survey of Missouri, by G. Broadhead. Vol. I, 1873-4.
VALENTINE, Mrs. Friend's Review. 1850 to 1874. Miscellaneous pamphlets, 25.

By Exchange.

BOSTON SOCIETY OF NATURAL HISTORY. Proceedings. Vol. XVII. Dec., 1874, Feb. 1875.
NEW YORK CHAMBER OF COMMERCE. Annual Report, 1874-75.
N. E. HISTORIC-GENEALOGICAL SOCIETY. Register. July, 1875.
N. Y. GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Record. July, 1875.
PHILA. ACADEMY OF NATURAL SCIENCES. Proceedings. Jan. to Apr., 1875.
YALE COLLEGE. Obituary Record of Graduates. 1875. Yale College in 1875.
PUBLISHERS. American Journal of Science. Beetle and Wedge. Boston Daily Globe. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Salem Post. Salem Gazette. Salem Observer. Salem Register. Turner's Public Spirit.

George W. Cressy and Dorcas C. Nourse of Salem were elected resident members.



REGULAR MEETING, MONDAY, SEPT. 6, 1875.

Meeting this evening. The PRESIDENT in the chair.
Records read.

The SECRETARY announced the following correspondence :—

From American Numis. and Archæol. Soc., Aug. 10; Bureau of Education, Washington, Aug. 26; Bristol Naturalists' Soc., Aug. 12; C. H. Dall, Boston, Aug. 7; London Soc. of Antiquaries, Aug. 4; Lisbon Royal Acad. Sci., July 30; Salem Young Men's Union, Aug. 16; W. Hudson Stephens, Lowville, Aug. 26; W. Wheeler, West Roxbury, Aug. 16.

The following additions to the library were reported :—

By Donation.

BAKER, C. H., Annapolis, Md. Papers and Proceedings of the U. S. Naval Institute. Vol. I. 1874.
BUTLER, B. F. Message and Documents, 1874-75. Abridgement. 1 vol.
CONANT, W. P., West Newbury. Missionary Magazine, 1807. Locomotion by A. Gordan. Georgia Claims.
COX, E. T., Indianapolis, Ind. Geological Survey of Indiana, 1874.
CROWELL, E. P., of Amherst. Triennial Catalogue of Amherst College, 1875.

GARFIELD, E. I., Detroit, Mich. Report of the Controller of Detroit, year ending Jan. 31, 1875.

LEE, JOHN C. Commercial Bulletin, July and August, 1875.

MARSH, O. C., New Haven, Conn. Statement of affairs at Red Cloud Agency, made to the President of the U. S.

MERRITT, L. F. Essex County Mercury, April to August, 1875.

OLIVER, H. K. Report of the Connecticut Board of Education, 1873. School Report of Michigan, 1872. Penn. Report of the Institute of Mines, 1870. Report of the Department of Agriculture, 1863. Report on American Fisheries. Smithsonian Report, 1863. Transactions Mass. Agricultural Society, 3 vols. Agriculture of Mass., ten years. U. S. Coast Survey, 1832. Worcester's Gazetteer, 2 vols. Memoir of Ebenezer Bailey. Memoir of Solomon Willard. Mass. State Board of Charities, 1867, 1870-1, 1873-4. Registration Report, 1873. Auditor's Report, 1864. Report of the State Board of Health, 1871. Agriculture of Maine, 1865, 1866, 1867. The Art of Singing, 2 vols. National Lyric, 1 vol. Miscellaneous pamphlets, 64.

PATCH, GEO. W., Marblehead. Registration Reports, 1858 to 1872, 15 vols. Board of State Charities, 1865 to 1873, 7 vols. Report of the State Board of Health, 1870 to 1874, 4 vols. Journal of the Mass. House of Reps., 1865, 1866, 2 vols. Census of Boston, 1845. Industry of Mass., 1865. Census of Mass., 1860, 1865, 2 vols. 8vo. Report of Mass. Board of Education, 1859 to 1872, 14 vols. Animal Magnetism, 1 vol. The Psalmist, 1 vol. Railroad Returns, 1863 to 1872, 10 vols. Journal of the Mass. Convention, 1853, 1 vol. Patent Office Reports, 1853, 1855, 1856, 1860, 1861, 5 vols. Report on Ship Canal, 1864, 1 vol. Logic and Utility of Mathematics, 1 vol. Reeves' Bible History, 1 vol. Vocal Culture, 1 vol. Polyglott Bible, 1 vol. New Testament, 1 vol. Vindication of the Government of N. E. Churches, 1 vol. Sacred Lyre, 1 vol. Bible News, 1 vol. Manual of the General Court, 1856 to 1873. Miscellaneous pamphlets, 850.

QUINT, A. H., New Bedford. Minutes of the General Association of Mass., 1875.

U. S. PATENT OFFICE. Official Gazette, June 15, 23, July 6, 13, 20, 27, Aug. 3, 10.

By Exchange.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. Memoirs, No. I.

ARCHIV DER ANTHROPOLOGIE, Paris. Band VIII. Apr., 1875.

BRISTOL NATURALISTS' SOCIETY. Proceedings. New Series, Vol. I, pt. II, 1874-5.

CROSSE ET FISCHER. Journal de Conchyliologie. 3e Série, Tome xv. No. 2, 1875.

INSTITUT HISTORIQUE, Paris. L'Investigateur. Mars-Avril, 1875.

NATURWISSENSCHAFTLICHEN GESELLSCHAFT "ISIS" DRESDEN. Sitzungs-Berichte, Jahrg. 1874, Oct., Dec.

NATURWISSENSCHAFTLICHEN VEREINE ZU BREMEN. Abhandlungen, Bd. IV, Heft 2, 3. 1874-5. 8vo. Bellage, No. IV, 1874. 4to.

N. Y. LYCEUM OF NATURAL HISTORY. Annals. Vol. xi. Nos. 5-6. 1875.

ROYAL SOCIETY OF TASMANIA. Monthly Notices for 1873.

SOCIÉTÉ D'ACCLIMATATION, Paris. Bulletin Mensuel, 8me Série. Tome II, No. II, 1875.

SOCIÉTÉ D'AGRICULTURE, SCIENCES ET ARTS DE LA SARTHE, LE MANS, France. Bulletins. Tome xxiii, 1875.

SOCIÉTÉ D'ANTHROPOLOGIE, Paris. Bulletins, Tome ix, 2e Série. Juin-Juillet, 1874. Tome x, 2e Série. Jan-Mars, 1875.

WESTERN RESERVE AND NORTHERN OHIO HISTORICAL SOCIETY. Cleveland Directories, 1845 to 1871. Miscellaneous pamphlets, 6.

PUBLISHERS. American Journal of Science. American Naturalist. Beetle and Wedge. Boston Daily Globe. Bradford New Era. Forest and Stream. Gardener's Monthly. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill

Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Salem Gazette. Salem Observer-Salem Post. Salem Register. The Western. Turner's Public Spirit.

REGULAR MEETING, MONDAY, SEPTEMBER 20, 1875.

MEETING this evening. Vice President **F. W. PUTNAM** in the chair. Records read.

Ellen B. Kelman was elected a resident member. William De Roux of Panama, and Charles P. Perkins, U. S. N., Annapolis, Md., were elected corresponding members.

**ADJOURNMENT OF QUARTERLY MEETING, MONDAY,
OCTOBER 4, 1875.**

THE adjournment of the August Quarterly Meeting was held this evening. Vice President **F. W. PUTNAM** in the chair.

On the motion of Rev. E. C. **BOLLES** the Constitution and By-laws proposed at the Quarterly Meeting in February, and at the Annual Meeting in May, were adopted after a discussion by Messrs. A. H. Johnson, D. B. Hagar, E. C. Bolles, John Robinson, W. D. Northend and C. H. Higbee.

Adjourned to meet on Monday, Oct. 11, at 7.30 P. M.

THE REGULAR MEETING was held immediately after the adjournment of the Quarterly. Records read; and the correspondence was announced by the Secretary:

From Belfast Naturalists' Field Club, Sept. 6; Charles Cadman, Detroit, Mich., Sept. 2; S. A. Drake, Boston, Sept. 22; J. W. Hawes, New York, Sept. 6; J. C.

Holmes, Detroit, Mich., Sept. 24; O. A. Jenison, Lansing, Mich., Sept. 6; Rufus King, New York, Sept. 23; G. W. Patch, Marblehead, Sept. 8; W. Hudson Stephens, Grand Rapids, Mich., Sept. 23; Charles A. Walker, Chelsea, Sept. 10; Western Reserve Historical Society, Sept. 14, 17; W. Wheeler, West Roxbury, Sept. 7; W. C. Wood, Wenham, Sept. 22.

The LIBRARIAN reported the following additions to the Library : —

By Donation.

AIKIN, EDWARD, East Saginaw, Mich. East Saginaw and Saginaw City Directories, 1868-9, 1870-1.

CITY OF SALEM. Centennial Exercises, Feb. 26, 1875.

KIMBALL, JAMES. Cape Ann Advertiser, July, Aug., Sept.

PUTNAM, F. W. N. Y. Tribune, July to Sept.

RANTOUL, HANNAH, of Beverly, Mass. Memoires de Sully, 3 vols., 12mo. L'Observation, 2 vols. Fordyce's Addresses, 1 vol. Hebrew Grammar, 1 vol. Apocryphal Testament, 1 vol. Modern Materialism, 1 vol. Religious Creed and Statements, 1 vol. Conn. Evangelical Mag., 1 vol. Historie des Revolutions Romaines, 4 vols. Bielky's Evidences, 1 vol. Moscow, 1 vol. Miscellaneous pamphlets, 107. SPENCE, F. A. Annual Report of the President of Brown University, July 17, 1875. 8vo.

U. S. PATENT OFFICE. Official Gazette, Aug. 17, 31, 1875.

By Exchange.

BOSTON SOCIETY OF NATURAL HISTORY. Proceedings. Vol. xvii, pt. iv, Feb., April, 1875. 8vo.

PUBLISHERS. American Naturalist. Beetle and Wedge. Boston Daily Globe. Gloucester Telegraph. Hardwicke's Science-Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Salem Gazette. Salem Post. Salem Observer. Salem Register.

BY ADDITION. Documents, U. S. Cong., 1st Sess., 30 Cong., 4 vols.; 1st Sess., 33 Cong., 13 vols.; 2nd Sess., 32 Cong., 8 vols.; 1st Sess., 33 Cong., 5 vols. Directories, Concord, 1870; Cambridge, 1868; Lowell, 1870; Bangor, 1871-2; Nashua, 1868-9; Dover and Great Falls, 1869; Somerville, Arlington and Belmont, 1869-70; Haverhill and Bradford, 1869-70, 1872, 2 vols.; Rockland, Belfast, Camden and Thomaston, 1868; Metropolitan Business Directory, 1869, 1870, 2 vols; Waltham and Watertown, 1869-70.

Mr. AUGUSTUS S. BROWN presented a bud of the banana plant from St. Augustine, Florida.

Mr. JOHN ROBINSON gave a description of the plant, illustrating his remarks with the bud presented and with a stalk and leaf from his greenhouse, and by diagrams on the blackboard.

Prof. E. S. MORSE spoke of his recent researches at

Grand Menan, and described some points in the embryology of several species of birds.

Mr. JAMES KIMBALL presented from Capt. J. J. Coker a specimen of *Hippocampus* sp., which formed the subject of remarks by the chairman.

Eva M. Davis of Salem was elected a resident member.



ADJOURNED QUARTERLY MEETING, MONDAY,
OCTOBER 11, 1875.

MEETING this evening at 7.30 o'clock. Vice President PUTNAM in the chair.

On motion of Mr. JOHN ROBINSON :

Voted, To proceed to the election of officers and that a committee be appointed by the chair to nominate a list.

Messrs. W. P. Upham, E. S. Atwood and John Robinson were appointed as the committee.

The following list was reported and the persons named were elected :

President: Henry Wheatland.

Vice Presidents: Abner C. Goodell, Jr., Frederick W. Putnam, William Sutton, Daniel B. Hagar.

Secretary: George M. Whipple.

Treasurer: Henry M. Brooks.

Auditor: Richard C. Manning.

Librarian: William P. Upham.

Curators: History, James Kimball; Manuscripts, William P. Upham; Archæology, Frederick W. Putnam; Numismatics, Matthew A. Stickney; Geology, Alpheus

S. Packard, Jr.; Botany, John Robinson; Zoology, E. S. Morse; Horticulture, Caleb Cooke; Music, Charles H. Higbee; Painting and Sculpture, Thomas F. Hunt; Technology, Edwin C. Bolles.

Committees: Finance, John C. Lee, James Upton, James B. Curwen, James O. Safford; Library, Joseph G. Waters, Henry F. King, George F. Flint, Amos H. Johnson; Publication, Abner C. Goodell, Jr.; Edward S. Atwood, William P. Upham; Lectures, Charles H. Higbee, Edwin C. Bolles, William D. Northend; Field Meeting, George M. Whipple, Allen W. Dodge, James R. Nichols, George D. Phippen, Francis H. Appleton, Amos Noyes, Francis H. Johnson, Amos H. Johnson, George Perkins.

Rev. Charles Arey of Salem, was elected a resident member.

Mr. JOHN ROBINSON presented the following

ADDENDA TO THE FERNS OF ESSEX COUNTY.

(Bulletin E. I., Vol. VII, No. 3, March, 1875.)

10 A. WOODWARDIA ANGUSTIFOLIA Smith.

Dr. Charles Pickering informs me that Mr. Wm. Oakes, in a letter written some forty years ago, speaks of finding this species while botanizing. The locality, Dr. Pickering was quite certain, was in Essex Co., probably at Danvers.

25 A. PHEGopteris HEXAGONOPTERA Fée.

Fine specimens of this species were found by Mrs. Horner at Georgetown, Sept., 1875 (see herb. Essex Co. at P. A. S.).

Thus two species are added to the County ferns from the list in the first paper indicating possible inhabitants.

Among the possible inhabitants see No. 5, *B. simplex*, from Long Island, N. Y. This will probably prove to be a mistake, and should be No. 6, *B. matricariæfolium*.

Mr. Frank Lufkin of Rockport has sent me *LYCOP-*

DIUM CLAVATUM, L. *ANNOTINUM* and *L. LUCIDULUM* from that town, species not common in the County, and not reported previously from that quarter.⁵

I have found *EQUISETUM HYEMALE* at Methuen and Boxford during the past season.

While dredging for animals and plants in Wenham, Pleasant and Chebacco ponds, during July and August, 1875, I collected among the Cryptogamous plants the following:

ISOETES ECHINOSPORA Durieu var. *BRAUNII*. In shallow water at Pleasant pond. (The first species of *Isoetes* yet reported in the County; doubtless others are to be found.

Characeæ (2 gen., 6 species) (named by Mr. C. C. Frost, of Brattleboro, Vt.).

CHARA CORONATA var. *SCHWEINITZII*. Wenham pond, abundant.

CHARA GYMNOPUS var. *ELEGANS* A. Br. Pleasant pond, Wenham, "new to New England."

CHARA VULGARIS L. (*C. foetida* of authors). Pleasant pond, Wenham, common.

NITELLA GRACILIS Agh. Chebacco pond, abundant.

NITELLA FLEXILIS Agh. Wenham pond.

—————? "Unknown to me, perhaps new to this region."
C. C. Frost.

Any local county lists or notes on the plants of the county will be gladly received.

Capt. SAUNDERS, of Orlando, Me., presented to the Institute a vampire, several snakes, and a very curious bone belonging to the dorsal fin of a fish, which were remarked upon by the chairman.

⁵ Since the above was communicated, and just as this goes to press (May, 1876), I also found these species in Beverly.

1876

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 7. SALEM, MASS., NOV. AND DEC., 1875. Nos. 11 & 12.

One Dollar a Year in Advance. Ten Cents a Single Copy.

REGULAR MEETING, MONDAY, OCTOBER 18, 1875.

MEETING this evening. Vice President F. W. PUTNAM in the chair. Records read.

Dr. GEORGE A. PERKINS exhibited some curious specimens of coal and charcoal; also beautiful impressions of ferns in coal and stone, and made some remarks on the subject. The chairman continued the subject, and spoke on coal deposits in this country, and of the fossil remains of fish found in several carboniferous deposits.

Mr. WILLIAM P. UPHAM read an interesting paper relating to the settlement of Rev. Samuel Skelton, minister of the First Church in Salem. He also called attention to the value of old letters and papers, and the importance of their preservation. The paper was referred to the publication committee for insertion in the "Historical Collections."

Mr. KIMBALL exhibited plaster casts of two very curious utensils supposed to have been made by the Indians and described the way in which they were probably made and the conditions under which the original specimens had been found. One was supposed to be a part of a large mortar and the other a cooking vessel. The chairman made some statements of his researches among Indian relics, explanatory of the casts on exhibition.

Mr. C. H. HIGBEE laid on the table for examination some specimens of minerals which he had collected, and gave a brief description of them. This led to a discussion of the minerals of this county, particularly of those found in the region of Newbury, and which have recently excited great interest, Messrs. Higbee, Kimball, Putnam and others taking part.



REGULAR MEETING, MONDAY, NOVEMBER 1, 1875.

MEETING this evening. Vice President F. W. PUTNAM in the chair. Records of last meeting read.

The SECRETARY announced the following correspondence:—

From Francis H. Appleton, Boston, Oct. 19; Charles Arey, Salem, Oct. 19; Helen F. Ayres, Boston, Oct. 19; S. L. Boardman, Augusta, Me., Oct. 5; E. P. Boon, New York, Oct. 26; John J. Bagley, Detroit, Mich., Oct. 17; Fidelia Bridges, Brooklyn, N. Y., Oct. 18; James B. Curwen, Salem, Oct. 13; J. Edmonds Clarke, Washington, D. C., Oct. 28; Samuel A. Drake, Boston, Oct. 5, 7; John Ward Dean, Boston, Oct. 5; J. P. Felton, Salem, Oct. 27; S. A. Green, Boston, Oct. 13; F. B. Hough, Washington, Oct. 2; Rufus King, New York, Oct. 16; H. M. Knowlton, Boston, Oct. ; Lynn Public Library, Oct. 29; I. P. Langworthy, Boston, Oct. 9; Michigan State Library, Oct. 9; Michigan State Geological Survey, Oct. 27; Amos Noyes, Newburyport, Oct. 16; George Peabody, Salem, Oct. 30; Richard A. Proctor, Boston, Oct. 21; E. P. Robinson, Saugus, Oct. 6, 11; W. Hudson Stephens, Lowville, N. Y., Oct. 13; Smithsonian Institution, Oct. 12; Joseph G. Waters, Salem, Oct. 13; Justin Winsor, Boston, Oct. 15.

Prof. A. GRAHAM BELL gave a very interesting lecture on the system of "visible speech" invented by his father, illustrated by charts of the symbols representing the various sounds, and by practical examples of the value of the system in teaching deaf mutes to speak, as tested by the ability of a young pupil from the Boston Institution to interpret the symbols at sight. The exposition of the value of the system, both in its linguistic and educational aspects, was listened to with intense interest, and the tests were eminently satisfactory.

After the close of the lecture a conversation followed between Rev. E. B. Willson, the lecturer, and others, in which several questions were proposed and answered. A vote of thanks was then passed to Mr. Bell for the evening's instruction.

Edward J. Johnson of Nahant was elected a resident member.



THE SECOND ART EXHIBITION

OPENED on Tuesday, Nov. 9, at the rooms of the Institute, Plummer Hall, and closed Wednesday the 17th. About twelve hundred persons visited the exhibition, not including members of the Institute and contributors. The main hall was devoted to the display of oil paintings, water colors, pen and ink and pencil sketches. The collection of portraits of persons prominent in Salem history attracted much attention, and among them were represented the productions of Copley, Stuart, Frothingham, Osgood, Alexander and others of our early artists. Our local artists presented many choice specimens, enumerated in the accompanying catalogue of two hundred

and eighty-three pictures by one hundred and eighty-six contributors.

The eastern ante-room was occupied by the exhibition of bronzes, porcelain and pottery; one hundred and five specimens from forty-seven contributors. This was the first ceramic exhibition in Salem, and it was an entire success, and many rich and curious articles were there displayed.

CATALOGUE OF THE SECOND ART EXHIBITION, NOVEMBER, 1875.

NO.	TITLE.	ARTIST.	CONTRIBUTOR.
1	James Miller.	C. Osgood.	Mrs. J. F. Miller.
2	Timothy Pickering.	S. L. Waldo.	J. Pickering.
3	John Pickering.	Chester Harding.	J. Pickering.
4	Richard Derby.	Sargent.	Misses Derby.
5	Thomas Cole.	C. Osgood.	Mrs. T. Cole.
6	Leverett Saltonstall.	C. Harding.	Mrs. J. F. Tuckerman.
7	Wm. Orne.		Essex Institute.
8	Jona. Webb.	Frothingham.	Gardner Barton.
9	Mrs. Edward Lander.	"	Misses Lander.
10	Edward Lander.	"	Misses Lander.
11	C. W. Upham.		Essex Institute.
12	William Bentley.		Essex Institute.
13	Zachariah Hicks.	Stuart.	Mrs. S. B. Howe.
14	B. Lynde Oliver.	Copy by Miss Gilbert.	J. G. Waters.
15	C. W. Upham.	Alexander.	Mrs. C. W. Upham.
16	A. Huntington.	B. C. Porter.	Mrs. A. Huntington.
17	Mrs. Lois Paine.		Mrs. J. S. Cabot.
18	Sir Richard Saltonstall.	Copy from Rembrandt, by C. Osgood.	Misses Saltonstall.
19	Pickering Dodge.	Frothingham.	W. A. Lander.
20	Penn Townsend.		J. G. Waters.
21	Mrs. Samuel Cook.		H. K. Oliver, Jr.
22	Nathaniel Lord.		G. R. Lord.
23	Alpheus Crosby.	E. Billings.	D. B. Hagar.
24	Nathaniel Hawthorne.		Mrs. G. B. Loring.
25	Wm. H. Prescott.	J. H. Young.	D. B. Hagar.
26	Nathaniel J. Lord.		George R. Lord.
27	Samuel Cook.		H. K. Oliver, Jr.
28	Family of Benjamin West.		Mrs. J. S. Cabot.
29	Rebecca Cabot, daughter of Timothy Orne.		Mrs. J. S. Cabot.
30	Benj. Waters, about 1800.		J. G. Waters.
31	View on the Presumpscot.	H. R. Brown.	E. C. Bolles.
32	Crayon Head.	Pupil of Miss Merrill.	S. H. Worcester.

NO.	TITLE.	ARTIST.	CONTRIBUTOR.
33	View in Stowe, Vt.	G. M. White.	N. G. Simonds.
34	Water Color.	J. W. Thyng.	J. W. Thyng.
35	Drawing "The Page."	G. B. Haskell.	G. B. Haskell.
36	Flowers, French crayon.	Miss H. Putnam.	Miss H. Putnam.
37	Pencil drawing.	G. B. Haskell.	C. F. Archer.
38	Charcoal head.	Miss Ida Caller.	J. M. Caller.
39	Pen sketch.	O. W. H. Upham.	O. W. H. Upham.
40	Water color.	David Roberts, England.	Misses Saltonstall.
41	Out door sketch.	O. W. H. Upham.	O. W. H. Upham.
42	Lespieglerie.	G. M. White.	G. M. White.
43	Sketch at Seabrook.	Miss M. C. Allen.	Miss Allen.
44	La Mignonne.	G. M. White.	G. M. White.
45	Charcoal. Fancy head.	Miss Ida Caller.	J. M. Caller.
46	Copy of an old picture.	Miss H. F. Car- lton.	Oliver Carlton.
47	Charcoal. Fancy head.	Miss Ida Caller.	J. M. Caller.
48	Monarch of the Glen.	G. Southward.	Observatory Club.
49	Drawing.	J. B. Hudson, Jr.	J. B. Hudson, Jr.
50	Beatrice Cenci.	After Guido.	Wm. A. Lander.
51	St. Francis, founder of the Fran- ciscan Order.	Ribera.	Mrs. A. L. Peirson.
52	Water-Lilies.	Seavey.	G. W. Benson.
53	Pansies.	Seavey.	G. W. Benson.
54	Road-side View.	J. B. Hudson, Jr.	J. B. Hudson, Jr.
55	Flowering Vines.	Miss E. Gardner.	Miss E. Gardner.
56	Old Canal.	J. B. Hudson, Jr.	J. B. Hudson, Jr.,
57	Woodcock.	Mrs. G. P. Osgood.	Mr. G. P. Osgood.
58	Water color.	Sattler.	John C. Lee.
59	Woodcock.	Mrs. G. P. Osgood.	Geo. P. Osgood.
60	Palette Knife Sketch.	H. M. Knowlton.	H. M. Knowlton.
61	Grief.	H. M. Knowlton.	Miss Knowlton.
62	Head of a Boy.	H. M. Knowlton.	Miss Knowlton.
63	Apple Peddler.	Pupil of Miss Knowlton.	Miss Knowlton.
64	The Exile.	H. M. Knowlton.	Miss Knowlton.
65	Portrait of Lady.	H. M. Knowlton.	Miss Knowlton.
66	Wisteria.	Miss S. E. Smith.	Miss Smith.
67	Portrait, Miss Manning.	Miss S. E. Smith.	Miss S. E. Smith.
68	Interior of a Studio.	Pupil of Miss Knowlton.	Miss Knowlton.
69	Apple Blossoms.	H. M. Knowlton.	Miss Knowlton.
70	Apple Tree at Manchester.	H. M. Knowlton.	Miss Knowlton.
71	Priscilla, (after Hunt).	Miss Smith.	Miss Smith.
72	Wayside Flowers.	Miss Smith.	Miss Smith.
73	Study.	Pupil of Miss S. E. Smith.	Miss Smith.
74	The Willows.	Miss S. E. Smith.	Miss Smith.
75	Sketch.	Wm. M. Hunt.	Mr. Hunt.
76	Medford Spires.	"	Mr. Hunt.
77	Cactus.	H. M. Knowlton.	Miss Knowlton.
78	June Day.	After Rousseau.	Miss S. E. Smith.

NO.	TITLE.	ARTIST.	CONTRIBUTOR.
79	Study, charcoal.	Pupil of Miss Smith.	Miss S. E. Smith.
80	Study, charcoal.	Pupil of Miss Smith.	Miss S. E. Smith.
81	Study, charcoal.	"	Miss Smith.
82	Study, charcoal.	Miss H. M. Knowlton.	Miss Knowlton.
83	Sketch, charcoal.	Wm. M. Hunt.	Mr. Hunt.
84	Study, moonlight.	Miss H. M. Knowlton.	Miss Knowlton.
85	Study, from life.	Miss S. E. Smith.	Miss Smith.
86	Study, Azalia.	Pupil of "	Miss Smith.
87	Apple Blossoms.	Miss S. E. Smith.	Miss Smith.
88	Ginger Jar.	Pupil "	Miss Smith.
89	Planting.	Miss S. E. Smith.	Miss Smith.
90	Wild Flowers.	Pupil "	Miss Smith.
91	Portrait, Josh Billings.	Miss H. M. Knowlton.	Miss Knowlton.
92	Study.	Pupil of Miss Smith.	Miss Smith.
93	Wisteria.	"	Miss Smith.
94	Tea Roses.	Miss S. E. Smith.	Miss Smith.
95	Descent from the Cross.	(After Overbeck).	C. A. Ropes.
96	Madonna.	Copy from Raphael.	B. H. Silsbee.
97	Pond Lilies.	Mary H. Weston.	Miss Weston.
98	Saco River, N. Conway.	Geo. Newcomb.	Mr. Newcomb.
99	Cardinal Flower.	Nina Moore.	Mrs. K. Woods.
100	Water Color.		Miss Saltonstall.
101	Water Color.	Sattler.	J. C. Lee.
102	Water Color.		Miss Saltonstall.
103	Presumpscot Falls.	J. B. Hudson, Jr.	Mr. Hudson.
104	Moonlight.	R. D. Wilkie.	C. H. Higbee.
105	Dogs Heads.	Miss Nellie Haddock.	Miss Haddock.
106	Portrait, Mrs. Fitch.	Copley.	Misses Derby.
107	Pen Drawing.	Geo. M. White.	H. M. Brooks.
108	After the Storm.	Oliver.	C. A. Ropes.
109	Wild Flowers.	Mary H. Weston.	Miss Weston.
110	Baboon Lake.	Mrs. F. Cox.	Mrs. Cox.
111	Wild Flowers.	Mary H. Weston.	Miss Weston.
112	The Showery Day.	Mrs. F. Cox.	Mrs. Cox.
113	Woodcock.	W. B. Parker.	Mr. Parker.
114	White Cactus.	Miss Kate Johnson.	Miss Johnson.
115	Night Blooming Cereus.	"	Miss Johnson.
116	View on Lake George.	Fisher.	H. M. Brooks.
117	The Horse Fair.	Unknown.	Mrs. T. Hunt.
118	The Horse Fair.	"	Mrs. T. Hunt.
119	Marine View.	Ernest Fenollosa.	Mr. Fenollosa.
120	Pen Drawing.	Geo. M. White.	H. M. Brooks.
121	Pen Drawing.	"	H. M. Brooks.
122	Water Color.	Chinery.	T. F. Hunt.
123	Flower Piece.	Miss K. Johnson.	Miss Johnson.

NO.	TITLE.	ARTIST.	CONTRIBUTOR.
124	The Shepherdess.	Henri.	C. A. Ropes.
125	Landscape.	M. LaJoie.	H. M. Brooks.
126	Water Color.	G. M. White.	Mr. White.
127	Water Color.	"	Mr. White.
128	Sea Mosses.	Miss M. Goldthwaite.	Miss Goldthwaite.
		G. M. White.	Mr. White.
129	Water Color.	Unknown.	Mrs. C. F. Williams.
130	Water Color.	Jean Raoux.	Miss Jackson.
131	Portrait.	Lafaye.	George Peabody.
132	Portrait, Lady.	Geo. Newcomb.	Mr. Newcomb.
133	Shop in Paris.	After Gerharl.	George Peabody.
134	Diana's Baths.	Unknown.	Wm. A. Lander.
135	Woman Selling Provisions.	"	George R. Lord.
136	Interior.	Copy from Sir T. Lawrence.	J. P. Cook.
137	Landscape.	G. M. White.	Mr. White.
138	The Sisters.	Mary H. Weston.	Miss Weston.
139	Water Color.	School of Vernet.	Miss Jackson.
140	Water Color.	Mrs. M. J. David.	Mrs. E. Putnam.
141	The Dentist.	J. J. Enneking.	T. F. Hunt.
142	View near Naples.	Unknown.	J. M. Callier.
143	Portrait.	Mrs. H. M. Berry.	Mrs. Berry.
144	Sunset.	Mrs. A. M. Kindler.	Mrs. Kindler.
145	Scriptural Subject.	Pupil of Miss Merrill.	A. E. Whitman.
146	Reading Magdalen.	Mary E. Williams.	Miss M. E. Williams
147	Autumn.	Moretti.	Miss M. E. Williams
148	Deer.	Mary E. Williams.	Miss M. E. Williams
149	Cloister Life.	"	Miss M. E. Williams
150	Roman Forum.	A. O. Williams.	Miss A. O. Williams
151	Angels, after Raphael.	Mary E. Williams.	Miss M. E. Williams
152	Monks.	A. O. Williams.	Miss A. O. Williams
153	St. Peter's.	Mary E. Williams.	Miss M. E. Williams
154	Roman Beggar.	A. O. Williams.	Miss A. O. Williams
155	Study of an Arab.	Mary E. Williams.	Miss M. E. Williams
156	Heidelberg.	Unknown.	W. B. Parker.
157	Sans Souci.	Vervoort.	Essex Institute.
158	Mt. Aetna.	Böhm.	James O. Safford.
159	Alchemist.	E. Cecchini.	Mrs. J. S. Cabot.
160	View of Tivoli and Falls.	Mary E. Williams.	Miss M. E. Williams
161	Roman Peasant Girl.	Van Starckenburgh.	Mrs. E. D. Kimball.
162	Market Woman.	Miss Knight.	Miss Knight.
163	Game.	Geo. Newcomb.	C. S. Clark.
164	Landscape.	Mrs. H. M. Berry.	Mrs. Berry.
165	Twilight in Venice.	H. O. Young.	C. A. Ropes.
166	Head.		
167	Capture of Luther.		
168	Fancy Head.		
169	Salem Boy.		
170	Iris; after Guldo.		
171	Mt. Shasta.		

NO.	TITLE.	ARTIST.	CONTRIBUTOR.
172	Landscape.	J. Both.	George Peabody.
173	Water Color.	Miss Needham.	Mrs. T. Hunt.
174	Cherries:	G. M. White.	T. F. Hunt.
175	Landscape.	Wynants.	George Peabody.
176	Norwegian Scenery. After Gude.	S. P. Hodgdon.	George Peabody.
177	Woodbine.	Mrs. H. H. Davis.	Mrs. Davis.
178	Off Baker's Island.	G. M. White.	T. F. Hunt.
179	Pen Sketch.	G. M. White.	T. F. Hunt.
180	Magdalen.	Guido.	Mrs. S. B. Howe.
181	Washington.	Jos. Ames.	E. W. Upton.
182	St. Ursula.		Mrs. S. B. Howe.
183	The Wayside Trough.	A. P. Close.	J. P. Cook.
184	Head; after Miss Knowlton.	Miss Caller.	Miss Caller.
185	Osgood Fire Place.	Miss K. Brooks.	H. M. Brooks.
186	Basket of Chestnuts.	"	H. M. Brooks.
187	White Lily.	Miss L. E. Merrill.	Miss Merrill.
188	Flower Panel.	Miss Williams.	Miss Williams.
189	Wild Flowers.	Miss L. E. Merrill.	Miss Merrill.
190	Holy Family.	Unknown.	Geo. P. Osgood.
191	Fruit Piece.	Miss L. E. Merrill.	Miss Merrill.
192	Lily of the Valley.	L. L. A. Very.	Miss Very.
193	Gil Blas.	Van Lerius.	Miss Jackson.
194	Study.	Miss A. A. Agge.	Miss Agge.
195	Study from a cast.	W. H. White.	W. H. White.
196	Crab Apples.	Miss L. E. Merrill.	Miss Merrill.
197	Ginger Jar.	Geo. Newcomb.	Mr. Newcomb.
198	Flower Piece.	Miss Emily Williams.	Miss Williams.
199	Trees on Blue River, Nebraska.	T. M. Osborne.	Mr. Osborne.
200	View in Newbury, Vt.	Miss M. S. Bullard.	Miss Bullard.
201	Blackberry Vine.	Miss L. L. A. Very.	Miss Very.
202	Flower Panel.	Miss M. E. Williams.	Miss Williams.
203	Little Red Riding Hood.	Miss L. L. A. Very.	Miss Very.
204	Apple Blossom.	Miss C. L. Grant.	Miss Grant.
205	A fresh puff off shore.	S. G. W. Benjamin.	J. A. Gillis.
206	Morning on Columbia River.	H. O. Young.	J. P. Cook.
207	Wild Flowers.	Mrs. F. Cox.	Mrs. Cox.
208	The Mountain River.	J. Warren Thyng.	Mr. Thyng
209	Wild Flowers.	Mrs. F. Cox.	Mrs. Cox.
210	Marine View.	Geo. M. White.	N. G. Simonds.
211	Gloucester Beach.	S. S. Tuckerman.	J. F. Tuckerman.
212	Study of Rocks at Nahant.	Mrs. F. Cox.	Mrs. Cox.
213	Winter Scene.		W. A. Lander.
214	Landscape.		C. H. Higbee.
215	Dogs Heads; after Landseer.	Miss S. E. Smith.	Miss Smith.
216	Portrait.	Frothingham.	Misses Forrester.
217	Portrait.	Stuart.	Misses Forrester.
218	Portrait.	Alexander.	Essex Institute.
219	Placid Lake.	S. P. Hodgdon.	E. K. Benson.
220	Interior; with Figures.	Vautier.	Mrs. Mott.
221	Summer Sunset.	Miss H. F. Osborne.	Miss Osborne.

NO.	TITLE.	ARTIST.	CONTRIBUTOR.
222	The Play Mates.		Miss H. Silsbee.
223	Winter Sunset.	Miss H. F. Osborne.	Miss Osborne.
224	Marine View.	Geo. M. White.	H. F. Waters.
225	Spanish Peasants.	After Murillo.	Mrs. Mott.
226	Wayside Inn.		Miss Jackson.
227	White Mountain Brook.	Mrs. A. M. Kindler.	Mrs. Kindler.
228	Marine View.	Geo. M. White.	H. F. Waters.
229	Marblehead Neck.	Miss H. F. Osborne.	Miss Osborne.
230	Home they brought her Warrior dead.	" "	Miss Osborne.
231	Flowers.	Miss H. M. Knowlton.	H. F. Waters.
232	Marine View.	Miss Callier.	Miss Callier.
233	Angel.	After Fra Angelico.	Mrs. F. H. Lee.
234	Angel.	After Fra Angelico.	Mrs. F. H. Lee.
235	Water color.		W. A. Lander.
236	Washington.	After Stuart.	Miss H. E. Deland.
237	Alexander Hamilton.	Trumbull.	Essex Institute.
238	Sunset at Sea.	S. G. W. Benjamin.	T. F. Hunt.
239	May Flower.	Miss C. L. Grant.	Miss Grant.
240	Misty Morning on the Hudson.	G. D. Brewerton.	X. H. Shaw & Son.
241	Pen Drawing; Archb. Williams.	Willis B. Youngman.	E. N. Peabody.
242	From the Cliff, Newport.	G. D. Brewerton.	X. H. Shaw & Son.
243	Water Color.	Miss E. M. Burrows.	M. S. Shaw.
244	Storks Tower.	Mrs. A. Hyatt.	Mrs. Hyatt.
245	Study.	Geo. M. White.	H. F. Waters.
246	Flower Piece.	Miss E. M. Burrows.	Miss L. Tappan.
247	Peaches.	Mrs. H. M. Berry.	Mrs. Berry.
248	Dawn off White Island.	S. G. W. Benjamin.	Mr. Benjamin.
249	Misty Morning on Lake Thun.	Mrs. A. Hyatt.	Mrs. Hyatt.
250	Artists' Brook, N. Conway.	Miss L. Lander.	Miss Lander.
251	Water Color.	Miss F. Bridges.	Miss Bridges.
252	Water Color.	" "	Miss Bridges.
253	Our Sunny Knoll.	Miss E. Gardner.	Miss Gardner.
254	Water Color.	Miss L. Lander.	Miss Lander.
255	Roman Peasant.		Misses Saltonstall.
256	Ingtham Moat, Sussex.		Misses Saltonstall.
257	Peasant Girl from the Campagna.	Buckley, senior.	Misses Saltonstall.
258	Flower Piece.	Miss K. Johnson.	Miss Johnson.
259	A Quiet Nook.	Miss L. Lander.	Miss Lander.
260	Lilies.	Helen F. Ayres.	Miss Ayres.
261	Morning Glories.	Miss C. L. Grant.	Miss Grant.
262	Mill in Suabian Alps.	Mrs. A. Hyatt.	Mrs. Hyatt.
263	Whitby Abbey.	" "	Mrs. Hyatt.

NO.	TITLE.	ARTIST.	CONTRIBUTOR.
264	Water Color.	Miss E. M. Burrows.	M. S. Shaw.
265	Nobeka Beach.	Mrs. A. Hyatt.	Mrs. Hyatt.
266	Birds.	Miss L. Lander.	Miss Lander.
267	Wisteria.	Miss C. L. Grant.	Miss Grant.
268	Autumn.	Miss L. Lander.	Miss Lander.
269	After School.	J. F. Lyon.	Mr. Lyon.
270	Portrait.	Miss Myra Derby.	Miss Warner.
271	Scientific Drawing.	S. E. Cassino.	Mr. Cassino.
272	James Silver.		Wm. Silver.
273	Samuel Webb.		G. Barton.
274	Water Color.	Chinery.	T. F. Hunt.
275	Joseph Mosely.		Mrs. T. B. Russell.
276	Ancient Painting.		Nicholas Pittman.
277	Autumn Leaves.	Miss Alice Callier.	Miss Callier.
278	Autumn Leaves.	" "	Miss Callier.
279	Study.	W. H. White.	Mr. White.
280	New England Scenery.	H. F. Higgins.	J. P. Cook.
281	Everlastings.	W. H. White.	Mr. White.
282	Pond Lilies.	Mrs. G. P. Osgood.	Mrs. Osgood.
283	Fancy Head.	Geo. Southward.	J. M. Callier.

CERAMICS, BRONZES, ETC.

NO.	TITLE.	CONTRIBUTOR.
1	Collection of Pottery, etc.,	Tech. Dep. Essex Ins.
2	China Plate (Canton, modern),	Mrs. J. P. Cook.
3	Japanese Plate (modern),	Mrs. J. P. Cook.
4	Japanese cup and saucer (modern),	Mrs. J. P. Cook.
5	Japanese cup and saucer (modern),	Mrs. J. P. Cook.
6	Porcelain Pen Rest (Chinese),	Mrs. J. P. Cook.
7	Japanese Cup and Saucer (modern),	Mrs. J. P. Cook.
8	Jade Stone Ornament,	T. F. Hunt.
9	Japanese Plate (modern),	Mrs. J. P. Cook.
10	Cup and Saucer, hand-painted,	Mrs. Chas. S. Nichols.
11	Cup and Saucer, hand-painted,	Mrs. Chas. S. Nichols.
12	Cup and Saucer (Sevres China),	William Silver.
13	Christian Lamps and Vases from Catacombs at Rome,	Miss Mary E. Williams.
14	Models of Vases found in Pompeii,	Miss Mary E. Williams.
15	Ancient Etruscan Pottery,	Miss Mary E. Williams.
16	Ancient Lamp and Medallion,	Miss Louisa Lander.
17	Early North American Pottery,	F. W. Putnam.
18	Stone Pipe from Jagga Country, Africa,	Caleb Cook.
19	American Pottery,	Miss Louisa Lander.
20	Four examples of Beverly Pottery, decorated by Miss Kate Johnson,	J. Robinson.
21	Two examples of Beverly Pottery, decorated in India Ink by E. S. Morse,	E. S. Morse.
22	Lambeth Jug,	J. Robinson.
23	Four examples of Lancaster Pottery,	Mrs. C. S. Nichols.

NO.	TITLE.	CONTRIBUTOR.
34	Six examples of Chinese Pottery,	T. F. Hunt.
35	Japanese Pottery,	C. Cook.
36	Horse of Marly, Bronze,	J. C. Lee.
37	Bronze Leopard,	J. C. Lee.
38	Silver Bronze Vase,	J. C. Lee.
39	Bronze Leopard,	J. C. Lee.
40	Horse of Marly,	J. C. Lee.
41	Bronze Bell of St. Peter's,	J. C. Lee.
41a	Plate, Cup and Saucer, brought from China in the Grand Turk, 1785,	Misses Derby.
42	China Plate,	G. R. Curwen.
43	Cup and Saucer, Chinese (ancient),	G. R. Curwen.
44	Cup and Saucer, Chinese (ancient),	G. R. Curwen.
45	Old Nanking Custard Cup,	G. R. Curwen.
46	Tea Set, China, about 1800,	Mrs. Jos. Osgood.
47	Seven pieces of Canton Ware, about 1830,	Jona. Tucker.
47a	Four pieces of Old China,	Miss M. Whipple.
48	Plate, Old China,	Mrs. Frost.
49	Bowl, Japan,	Mrs. J. P. Cook.
49	Plate, Old China,	Mrs. Frost.
41	Porcelain and Wicker Work, Bowl and Plate, Japan,	Mrs. T. Hunt.
43	Plate, China,	Mrs. M. A. Andrews.
43	Plate, Old China,	Mrs. Jona. Perley.
44	Cup and Saucer, Canton Ware,	Mrs. Jona. Perley.
44a	Old Blue Tea Caddy, Cup and Saucer,	Misses Derby.
45	Saki Bottle, Japan,	Mrs. J. P. Cook.
46	Tea Pot, Japan,	Mrs. J. P. Cook.
47	Dragon Vase, China,	Mrs. J. P. Cook.
48	Porcelain Pagoda,	Mrs. T. Hunt.
49	Pair of Crackle Vases,	H. F. Waters.
50	Porcelain Ornaments,	Mrs. T. Hunt.
51	Dragon Vase,	Mrs. T. Hunt.
52	Porcelain Vase,	Mrs. J. P. Cook.
53	Cream Jug, Old China Ware,	Mrs. J. P. Cook.
54	Old Nanking Tea Pot,	Mrs. J. P. Cook.
55	Japanese Lacquer Porcelain Tea Pot,	Mrs. J. P. Cook.
56	Plate, formerly property of Royal Family, France,	Miss J. F. Bond.
57	Old French Ware, 1678,	Jona. Tucker.
58	Old Pencil Ware, four pieces,	Jona. Tucker.
59	Two Old Tiles,	Mrs. T. B. Russell.
60	Cream Jug, Old English Ware,	B. D. Hill.
61	Bowl,	B. D. Hill.
62	Old English Ware,	Mrs. T. B. Russell.
63	Bowl,	G. P. Daniels.
64	Coffee Pot, 1775,	G. P. Daniels.
65	Coffee Pot, China, 1803,	Mrs. E. Emmerton.
66	Pencil Ware, Cup and Saucer,	Miss E. H. Kimball.
67	Liverpool Ware, plate,	G. R. Curwen.
68	Pitcher, taken by a Privateer, 1813,	Mrs. M. A. Tufts.
69	Chelsea Ware,	Miss J. F. Bond.
70	Sugar Bowl, Gen. James Miller's Wedding Set,	Mrs. C. H. Higbee.
71	Dutch Porcelain Mug,	Miss L. Lander.
72	Old English Ware Gravy Dish,	Miss L. Lander.

NO.	TITLE.	CONTRIBUTOR.
73	Sugar Bowl, Wedgwood Ware, Flaxman's designs,	Miss L. Lander.
74	Louis 14th Mug and Saucer,	Miss L. Lander.
75	Old Indian Mug and Saucer,	Miss L. Lander.
76	Independence Ware Plate,	E. L. Perley.
77	Vase, French,	Mrs. C. H. Higbee.
78	Masonic Wine Glass,	Jona. Perley.
79	Glass Ware,	Mrs. G. M. Whipple.
80	Japanese Crystal,	Mrs. T. Hunt.
81	Glass Bottle, 1767,	Jas. Kimball.
82	Glasses used by Gen. Miller in war of 1812,	Miss M. E. Miller.
83	Hour Glass Bottle,	Miss E. H. Kimball.
84	Old English Glass,	G. R. Curwen.
85	Old Beer Jug, English,	B. D. Hill.
86	Native Majolica, Boston, Nov. 9, 1873,	J. Robinson.
87	Puzzle Pitcher,	Jas. Kimball.
88	Beer Mug,	Jas. Kimball.
89	German Vase,	Jas. Kimball.
90	Bowl and Pitcher,	Miss A. Grant.
91	Collection of Coins of all Nations, from the earliest times to the present, showing the progress of the art of coinage, arranged and contributed by	J. Robinson.
92	Modern copy Burnt China,	H. F. Waters.
93	Old Burnt China,	H. F. Waters.
94	Old Burnt China,	H. F. Waters.
95	Delft,	H. F. Waters.
96	Old China,	H. F. Waters.
97	Old China,	H. F. Waters.
98	Delft,	H. F. Waters.
99	Japanese Teapot,	H. F. Waters.
100	Rouen Jar,	H. F. Waters.
101	Japanese Saucer,	H. F. Waters.
102	Burnt China Cup and Saucer,	H. F. Waters.
103	Silver Watch 150 years old,	Miss Mary E. Williams.
104	Silver Bell, figure of Silenus,	H. F. Waters.
105	Two watches 150 years old,	H. F. Waters.
106	Old China Cup and Saucer,	H. F. Waters.
107	Rouen Jar,	H. F. Waters.
108	Chinese Teapot,	Mrs. T. Hunt.
109	Old Cake Dish,	H. F. Waters.
110	Very old China Bowl,	H. F. Waters.
111	Blue China Dish,	H. F. Waters.
112	Elder Brewster Teapot,	H. F. Waters.
113	Old China Coffee Cup and Saucer,	H. F. Waters.
114	Old China Soup Plate,	H. F. Waters.
115	Specimen of Rogers Ware, English,	H. F. Waters.
116	Old China Tea Caddy and Stand,	H. F. Waters.
117	Delft Plate,	H. F. Waters.
118	Old China Tea Pot,	H. F. Waters.
119	Blue China Dish,	H. F. Waters.
120	Old China Bowl,	H. F. Waters.
121	Decorated China,	H. F. Waters.
122	Twenty-eight pieces of Glass Ware, of English, German and Venetian make,	H. F. Waters.

NO.	TITLE.	CONTRIBUTOR.
123	Painting on Copper, silver frame,	Miss Mary E. Williams.
124	Door Plates,	Miss Kate Johnson.
125	Whist Counters,	J. Robinson.
126	Wedgwood Portrait Sir W. J. Hooker,	Mrs. E. G. Perkins.
127	Portrait in Wax,	Miss E. H. Kimball.
128	Highland Mary Snuff Box,	
129	Collection of Miniatures,	Mrs. E. T. Kemble.
130	Painted Table Top,	Miss Louisa Lander.
131	Bronze Medallion of Gibson, the Sculptor,	Manuscript Department,
132	Collection of Manuscripts,	Essex Institute.
133	Collection of Ceramics,	Dep't of Technology, Essex Institute.
134	Bronze Figure.	Mrs. T. Hunt.
135	Bronze Group of Dogs,	J. C. Lee.
136	Bronze figure.	Mrs. T. Hunt.
137	Pair of Bronze Vases,	Mrs. T. Hunt.
138	Pair of Bronze Vases,	J. Robinson.
139	Sesostris.	J. Robinson.
140	Metallization of Plaster from "The Cluny,"	Mrs. C. S. Nichols.
141	Esculapius.	J. C. Lee.
142	Japanese Platter,	H. F. Waters.
143	Jupiter,	J. C. Lee.
144	Figure Metallization of Plaster from "The Cluny,"	Mrs. C. S. Nichols.
145	St. George and the Dragon,	A. H. Johnson.
146	Bronze Vases, Japanese,	J. P. Cook.
147	Pair of Carved Wood Stands, Chinese,	Mrs. T. Hunt.
148	Very old Chinese Bronze Vase,	A. S. Packard, Jr.
149	Bronze Figure (Horse),	J. C. Lee.
150	Damascus Metal Bowls,	Misses Forrester.
151	The Dying Gladiator,	Miss Saltonstall.
152	Bronze Vases, Japanese,	J. P. Cook.
153	Porcelain Vases, Chinese,	Mrs. T. Hunt.
154	Old Bronze Incense Burner, Chinese,	J. P. Cook.
155	Japanese Bronze,	J. P. Cook.
156	Incense Burner, Chinese,	Mrs. J. Osgood.
157	Pair of Gilded Vases, Chinese,	Mrs. J. P. Cook.
158	Pair of Japanese Vases,	Mrs. T. Hunt.
159	Pair of Bronze Incense Burners, Chinese,	Mrs. J. P. Cook.
160	Pair of Chinese Vases,	Mrs. J. P. Cook.
161	Old China Vase (about 1,400),	Mrs. T. Hunt.
162	Pair of Japanese Vases,	Mrs. T. Hunt.
163	Pair of Bronze Candlesticks, Japanese,	Mrs. J. P. Cook.
164	Pair of Bronze Ornaments, Chinese,	Mrs. J. P. Cook.
165	Pair of Bronze Vases, Chinese,	Mrs. J. P. Cook.
166	Japanese Stork Candlesticks,	Mrs. J. P. Cook.
167	Bronze Image Worshipped by the Chinese,	J. P. Cook.
168	Chinese Gong Bronze,	J. P. Cook.
169	Pair of Japanese Vases,	J. Robinson.
170	Pair of Candlesticks used in South Church, 1804,	J. Robinson.
171	Chinese Porcelain Jar,	J. Robinson.
172	Pair of Japanese Vases,	J. Robinson.
173	Japanese Cabinet.	J. Robinson.

NO.	TITLE.	CONTRIBUTOR.
174	Tea Caddy, Chinese,	J. Robinson.
175	Pair of Japanese Bottles,	J. Robinson.
176	Roman Lamp,	Miss M. E. Williams.
177	Pair of Japanese Platters,	J. Robinson.
178	Japanese Lacquer Platters,	J. Robinson.
179	Florentine Lamp,	Miss M. E. Williams.
180	Japanese Cabinet,	J. Robinson.
181	Japanese Vase,	J. Robinson.
182	Collection of Glass, etc.	Dep't of Tech. Essex In.
183	Collection of Tiles, etc.	Dep't of Tech. Essex In.
184	Collection of Beverly Pottery,	Mr. Lawrence.
185	Paper Making and Jug Making,	Dep't of Tech. Essex In.
186	Collection of Chinese and French Ware,	Mrs. C. F. Williams.



REGULAR MEETING, MONDAY, NOVEMBER 15, 1875.

VICE PRESIDENT GOODELL in the chair. Records read.

Mary E. Gould and George L. Upton of Salem were elected resident members.



REGULAR MEETING, MONDAY, DECEMBER 6, 1875.

MEETING this evening. In the absence of President and Vice Presidents, Mr. C. H. HIGBEE was requested to take the chair. Records read.

The SECRETARY announced the following correspondence:—

From Boston Public Library, Dec. 1; British Archaeological Association, Nov. 27; Historical Society of Pennsylvania, Nov. 30; F. B. Hough, Washington, D. C., Nov. 15; M. Knoedler & Co., New York, Nov. 3; G. P. Lothrop, Boston, Nov. 13, 16; Maryland Historical Society, Nov. 24; R. C. Manning & Co., Salem, Dec. 1; New York Historical Society, Nov. 30; Charles C. Perkins, Boston, Nov. 14; C. O. Thompson, Worcester, Nov. 13, 16.

The LIBRARIAN reported the following additions:—

By Donation.

- BAGLEY, JOHN J., of Lansing, Mich. Proceedings at the laying of the corner stone of the Capitol of Mich., Oct. 2, 1873.
- BAKER, NATHANIEL B., of Des Moines, Iowa. Adjutant General's Report of Iowa, Jan. 1, 1874 to Jan. 1, 1875.
- COLK, MRS. N. D. Kindergarten Messenger, 14 numbers.
- HAMMOND, CHAS., of Monson, Mass. Catalogue of Monson Academy, 1875-76.
- HUMPHREYS, A. A., of Washington, D.C. Report of a Reconnaissance of the Black Hills of Dakota made in 1874, by Wm. Ludlow. 1 vol., 4to.
- KIMBALL, JAMES. Cape Ann Advertiser, Oct. and Nov., 1875.
- JOHN C. LEE. Commercial Bulletin, Aug. to Nov., 1875.
- LEVETTE, GEO. M., of Indianapolis, Ind. Indiana Agricultural Reports, 1874, 5 vols. Transactions of the Indiana Horticultural Society, 1874. Indianapolis Directory, 1872-73. House Journal, 1871. Senate Journal, 1871. Ohio Statistics, 1872. New School Law of Indiana, 1873. Laws of the State of Indiana, 1871.
- MATTHEWS, W. L., of Warsaw, Ind. Report of the Superintendent of Public Instructions of Indiana, 1874.
- MAYER, ALFRED M., of Hoboken, N. J. Miscellaneous pamphlets, 5.
- MERRITT, L. F. Essex County Mercury, May to Nov., 1875.
- KEFF, J. E., of Indianapolis, Ind. Documentary Journal of Indiana, 2 vols., 8vo. Report of the Secretary of State, Oct., 1873, 1 vol., 8vo.
- PUTNAM, F. W. On the Habits of the Blind Crawfish, 8vo pamph., 1875. New York Tribune, Sept., Oct., Nov., 1875.
- STEPHENS, W. H., of Lowville, N. Y. Statutes of South Carolina, Vol. I, 1836.
- STONE, B. W. New York Directory, 1873. Essex Co. Directory, 1870. Salem Directory, 1869. N. Y. Business Directory, 1874.
- STONE, E. M., of Providence, R. I. Report of School Committee of Providence, June, 1875.
- THORNTON, J. WINGATE, of Boston. The Garden of Health, 1 vol., 4to.
- WADSWORTH, H. E., of La Porte, Ind. Rockport City Directory, 1872-73.
- U. S. DEPARTMENT OF INTERIOR. Documents, 42nd Cong., 2 vols. 1st Sess., 43rd Cong., 36 vols.
- U. S. BUREAU OF EDUCATION. Report of the Commissioner of Education, 1874. 1 vol., 8vo.
- U. S. PATENT OFFICE. Official Gazette, Aug., Sept., Oct., and Nov., 1875.
- UPTON, JAMES. Baptist Missionary Magazine, 1870-74. Good Health, 1871. Missionary Magazine, 1870.
- WARNER, OLIVER, of Boston, Mass. Mass. Public Documents, 1874, 5 vols. Acts & Resolves, 1875.
- WATERS, J. LINTON. History and Directory of Kent Co., 1870. Cincinnati Directory, 1840.
- UNKNOWN. Proceedings at the Centennial Celebration of the Battle of Lexington, Apr. 19, 1875. 1 vol.

By Exchange.

- AMERICAN ANTIQUARIAN SOCIETY. Proceedings of the, Apr. 23, 1875.
- AMHERST COLLEGE LIBRARY. Triennial Catalogue, 1875.
- ARCHIV FÜR ANTHROPOLOGIE, BRAUNSCHWEIG. Band viii. Aug., 1875.
- BELFAST NATURALISTS' FIELD CLUB. Annual Report of the, 1873-74. Guide to Belfast, 1 vol.

- BERWICKSHIRE NATURALISTS' CLUB. Proceedings of the, Vol. vii. No. II, 1874.
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Rev. GEORGE F. WRIGHT, of Andover, read the paper of the evening, an abstract of which is here inserted.

INDIAN RIDGE AND ITS CONTINUATIONS.

The so-called "Indian Ridge" of Andover, Mass., has long been an object of curiosity to citizens, and of interest to geologists. In the "Transactions of the Association of American Geologists and Naturalists," for 1841 and 1842, Pres. Edward Hitchcock, of Amherst College, gave a detailed account of the formation so far as it had then been observed.¹ This distinguished observer characterized it as "decidedly the most interesting and instructive case [of moraine ridges] which he had met with." A map of it is given in the same paper, taken from a survey of Professor Alonzo Gray, then of Andover, now of Brooklyn, N. Y. This map, in reduced dimensions, reappears in Hitchcock's *Elementary Geology*,² as an illustration of "Submarine Ridges."

The formation is described as a series of narrow, partially parallel and interlacing ridges, composed of sand, gravel and boulders intermixed. These ridges are said to be from fifteen to thirty feet high and four or five rods through at the base, extending a mile and a half or more, in a line nearly north and south. Similar ridges two or three miles south are alluded to; and at South Reading, now Wakefield, twelve miles south of Andover, still other and higher ridges of a like nature were observed. At the close of his remarks upon the subject, Dr. Hitchcock writes, "I presume that still further careful examination of the region above described may show other similar ridges, or a continuation of those on the map. . . . I would gladly resurvey all the moraines with which I am acquainted, in the confident belief that now 'I have learnt

¹ See page 198.

² See page 260 (80th edition).

to see,' I should find many of them continuous ridges where I have supposed a confused group of moraines to exist." Acting upon this hint I have given my spare time for many months back, in attempting to add to our stock of knowledge upon the subject. I herewith furnish a brief survey of the results.

1. MEASUREMENTS. Taking them in order, going westward about half a mile from Andover depot, and measuring from their base, the East ridge is 41 feet high, the Middle or Indian ridge is 49 feet, and the West ridge 91 feet. The base is 40 feet above the Shawshin river, and 90 feet above the sea level. So that the summits of these ridges at this point are, respectively, 131, 139, and 181 feet above the ocean. The west ridge at the place of measurement is 250 feet broad at the base. I am indebted to various members of the scientific class of 1875, in Phillip's Academy, for assistance in securing these measurements.

2. COMPOSITION. These ridges were not primarily stratified, and so differ in an important respect (if their observations were sufficiently accurate) from the "Horsebacks" of Maine, described by Professor C. H. Hitchcock,³ and the "Kames" of Scotland, described by James Geikie.⁴ There is, however, usually a secondary stratification along the flanks of the ridge, and around the rim of the numberless basins that are enclosed by its interlacing branches, and in some places the entire ridge is stratified. But ordinarily, sand, gravel, pebbles and boulders are indiscriminately mingled. Boulders from a few inches to two or three feet in diameter are found in the higher portions of the Ridge as well as in the lower.

3. CHARACTER OF THE STONES. The stones of the ridge are uniformly rounded and polished, but I have

³ See Maine Agricultural Reports, 1861, 1862. ⁴ See The Great Ice Age, pp. 210-237.

failed to find any scratches upon their surface, such as are frequently found upon those of the "ground moraine" of this region. They are not of local origin, but consist, in indiscriminate mixture, of granite, gneiss, and slatestones from the North. Among these a rose quartz is abundant.

4. **EXTENT OF THE RIDGE.** With only such interruptions as are made by river valleys and water courses, or by other apparent causes, I have traced this series of ridges, in continuous line, from Wakefield, through Reading, North Reading, Wilmington, Ballardvale, Andover, Lawrence and Methuen to Salem in New Hampshire, a distance of nearly twenty-five miles as the bird flies. I have with tolerable certainty identified it on either side of these limits: south, in Melrose and Malden; north, as far as Derry Station, N. H.

5. **DIRECTION.** It will be observed that this line corresponds with the direction of the glacial striæ of this vicinity, about 15° N. W. by S. E. The line projected to the north would coincide with the axis of the Merrimack valley above Manchester, N. H.

6. **HYPOTHESIS.** We have not time to work out the details of the hypothesis which accounts for the facts so far as at present observed. It is sufficient to say that we expect eventually to demonstrate that this net-work of ridges is the medial moraine of that portion of the continental glacier which took its local direction from the Merrimack valley. The floods of water which during the period of its retreat flowed forth from the foot of that glacier would account for the partial stratification that is observed.

7. **CONCLUSION.** But we wait for further investigation, especially in the line north and south. And we solicit facts from any observers, first, as to the composition of the hills in this vicinity, and for twenty miles east or

west of the line of this Ridge, whether they are of solid rock, or of loose material, whether stratified or not, and whether the material is of local origin. And furthermore what is the direction of the axis of these "drift" hills? And are there elsewhere such ridges as we have described; and what is their direction? The Essex Institute would do an important work if its members should systematically collect the facts concerning the whole drift deposit of the Merrimack valley. When these are gathered and arranged, we can popularize for this region the intensely interesting subject of the glacial age, which now does not have the practical hold of the popular imagination that its merits, and the proximity of its phenomena, demand.

At the close of the lecture the subject was continued by remarks from Dr. A. H. Johnson, Messrs. W. P. Upham, C. H. Higbee and others, and a vote of thanks was passed to Mr. Wright for his instructive paper.

George West, George Newcomb and C. A. Shaw were elected resident members.



REGULAR MEETING, MONDAY, DECEMBER 20, 1875.

MEETING this evening. The PRESIDENT in the chair. Records read.

Robert C. Mills, Charles R. Mills, George W. Benson, E. K. Benson, Lewis F. Miller, S. F. Chase, D. B. Kimball and Abby R. Knight were elected resident members.

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VOLUME VIII.

1876.

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BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 8. SALEM, MASS., JANUARY, 1876. No. 1.

One Dollar a Year in Advance. Ten Cents a Single Copy.

REGULAR MEETING, MONDAY, JANUARY 3, 1876.

MEETING this evening. The PRESIDENT in the chair.
Records read.

The paper for the evening was on "The Instinct and Intelligence of Animals," by S. C. OLIVER.

Colonel Oliver illustrated his remarks with explanatory anecdotes, and said that spoken and written language and all the significant machinery of human life had come to be regarded as essential parts of our intelligence, and it would be no easy matter for us to represent to ourselves the movements of the human intellect deprived of the assistance of that artificial apparatus employed by human beings to enlarge the compass of thought and of knowledge. It is quite necessary however to make the attempt to set forth the fundamental peculiarities of intelligence in general, that we may, by this means, gain another step towards the rational explanation of the animal mind.

The first great feature of intelligence common to the

whole animal race, with of course difference of degree, we may express by the term *docility*, meaning by it the power of making acquisitions of every kind independent of the native or inborn capacities. There is evidently a great inferiority in the extent and in the character of the brute acquisitions as compared with humanity. It is doubtful how far an ordinary quadruped can revive the pictorial impressions of sight in the entire absence of the original so as to go through an operation truly mental, and live in the past, the present and the future. The best of animals can go but a little way towards recognizing the proportions of natural objects, chiefly on account of their utter want of all the artifices of indirect vision, which have their perfect exemplification in the human sciences.

It usually happens that every active weapon or instrument belonging to the structure of an animal is fully provided with nervous communications with all the other parts of the system through the common centre of nervous action, and is in this way put to employment on all convenient occasions. Nothing more is required than such a method of connection to insure the application of every species of active impulse wherever it can be of any avail. The electric organs of the torpedo are related by massive cords of nerve to the brain of the animal, and act in sympathy with its wishes and movements.

We are to conceive of each class of animals as possessed of a certain number of susceptibilities and active capacities in more or less measure of energy, and also of the power of harmonizing, combining and arranging the one to meet the other through the medium of a central brain, and as having this power in unequal degrees.

The varieties of the sense of hearing furnish a basis of discrimination of the animal species. This sense is, per-

haps, on the whole, less complex and less dignified than the sense of sight, but this last sense is more extensively possessed than the power of hearing. The development of the ear goes along with the development of the vocal organs, and there is a special connection between the two in the nervous system. When the ear and the voice are in tolerable perfection they are put to a variety of uses. Besides the employment of the voice in the expression of the animal emotion and in kindling up sympathies and inspiring terrors into fellow beings, it very soon shows itself as an organ of language, or as a means of communication between the different members of any society of animals.

The SECRETARY announced the following correspondence : —

From Amherst College Library, Dec. 13; E. P. Boon, New York, Dec. 9; Instituto Historico e Geographico do Brazil; Cincinnati Public Library, Dec. 21; Dresden Kais. Leop. Carol. Deutsche Akademie der Naturforscher, Oct. 29; Emden, Naturforschende Gesellschaft, Oct. 15; LeRoy F. Griffin, Hightstown, N. J., Dec. 22; Hague, Entomol. Soc. of Netherlands, Oct. 19; Liege, Societe Geologique de Belgique, Sept. 15; Liverpool Literary and Philosophical Society, Dec. 3; Lynn Public Library, Nov. 16; München, K. Bayerischen Akademie der Wissenschaften, Nov. 1; E. P. Robinson, Nov. 10; Stockholm, L'Acad. Roy. Suedoise des Sciences, Nov.; Charles P. Thompson, Washington, Dec. 17; Throndhjem K. Norske Videnskabselskab, July 15; Upsal, Société Royale des Sciences, Oct. 15, Nov. 15, 20.

At the close of the meeting, on motion of Mr. WM. P. UPHAM, a vote of thanks was passed to Col. Oliver for his interesting communication.

The following persons were elected resident members : Mrs. D. B. Hagar, Mrs. C. H. Miller, Mrs. J. O. Safford, Mrs. D. W. Bowdoin, Harriet A. Austin, Hannah H. Silsbee, Horace N. Smith, Andrew D. Cross, Thomas H. Johnson., all of Salem.

REGULAR MEETING, MONDAY, JANUARY 17, 1876.

MEETING this evening. The PRESIDENT in the chair. Records read.

Mr. JOHN ROBINSON brought to the notice of the meeting the finding of the willow (*Salix discolor*) in blossom, stating that this was rarely the case in midwinter.

Mr. GEORGE M. WHITE, of Salem, read a paper on "Pottery," illustrating the same by some beautifully colored cartoons, prepared by himself, of some of the most celebrated specimens of pottery on record. He commenced by giving a brief sketch of the art in the earliest period of its history when the clay was made sufficiently hard for the simple wants of the people by exposure to the sun. The baking of the clay, so as to produce an indestructible tenacity was an immense stride, a rough and rude ornamentation was at that time adopted. Another step in the process was in rendering the vessels less porous and better fitted to hold liquids by covering them with an impervious glaze. Then followed the use of copper to obtain the brilliant blue enamel; other materials and processes were afterwards gradually introduced for the various kinds of ornamentation which was carried to so high a degree of perfection as to require the talents and skill of the most noted artists, and have become an almost inexhaustible source for illustrating the mythology, the history and the customs of the people.

A communication was read from Mr. JOHN J. HUTCHINSON, executor of the will of the late Miss ABBY W. DITMORE, in relation to the bequest therein noted.

On motion of Mr. A. C. GOODELL

Voted, That the Essex Institute will accept the bequest made by the residuary clause of the will of Abbie W. Ditmore, late of Salem, singlewoman, deceased, on the condition therein expressed, and will pay the income of the same to Frederick J. Perkins, cousin of said testatrix, during his life, and the Treasurer of said Institute is hereby authorized and directed to give a receipt for the same, and to pay the income thereof as required by said will during the life of said Frederick J. Perkins.

Voted, That said Treasurer be authorized to give bond to said executor to refund to said executor any part of said sum that may be recovered against said executor or said estate within two years of his acceptance of said trust.

On motion of Mr. R. C. MANNING it was

Voted, That the thanks of the Institute be given to Mr. George M. White for his handsomely illustrated lecture.

The following persons were elected resident members :
Mrs. J. F. Tuckerman, Edward Kemble, Winchester Smith, Samuel C. Oliver, Mrs. F. H. Lee, Chas. Henry Andrews, Wm. Phineas Parker, Clarence Edward Murphy.



SPECIAL MEETING, MONDAY, JANUARY 31, 1876.

THE PRESIDENT in the chair. The meeting this evening attracted a large audience.

Rev. E. S. ATWOOD gave an explanation of the manufacture of silver plated ware, illustrated by the elegant specimens which have recently been added to the technological department of the Institute through the generosity of Messrs. Reed and Barton, of Taunton, manufacturers, whose establishment ranks among the most distinguished.

The lecture was listened to with the utmost interest and closest attention.

The lecturer commenced with an allusion to the silver plating practised by the ancient Romans, the silver being soldered to copper and rolled out. This method was continued until the middle of the 18th century and was called the French process. He also spoke of the silvered wires for filigree work.

The French process was succeeded in England by fire-plating—silver fused upon copper without solder—known as the Sheffield process. In this the weight of silver was 1-24 to 1-30 that of the copper. This ware is remarkably serviceable and does not tarnish. A specimen more than a hundred years old was exhibited and the plating was apparently as perfect as when first made.

Amalgam plating was next described—silver and mercury mixed, the mercury volatilized.

The first electro plating, which is the modern process, was done in 1803, by Brugnatelli, a pupil of Volta. Elkington's patent was issued in 1840, and it was not until within twenty-five or thirty years that the manufacture began to assume its present proportions.

The general composition of the three bases, Britannia, German silver, and nickel silver was then given, Britannia being a compound of lead, tin, and antimony; German silver, of copper, zinc, and nickel; and so on.

The lecturer then took his audience into the manufacturing room and described the process by which the raw material is worked up into hollow ware, and spoons and forks, which latter is a special department of the business. The various methods of "chasing" were then considered, and silvered plates illustrating each variety were exhibited. The "plating" room was next described, with an enumeration of the various chemical and galvanic oper-

ations, employed at that stage of the work. Following this was a detailed account of the method of "burnishing," by which the lustreless silver is made to take on a high polish. The lecture closed with some practical directions as to the best way to buy, cleanse, and preserve the various articles of plated ware in use in the household.

A handsome tablet, containing specimens of the raw materials used, and of articles in various stages of manufacture, was among the donations by Reed & Barton, and the specimens, being removable, were, with the finished articles, passed around among the audience and enabled the listeners to follow the explanations with great satisfaction.

The LIBRARIAN reported the following additions to the library :—

By Donation.

- BOLLES, E. C. Miscellaneous pamphlets, 10.
 BUNKER HILL MONUMENT ASSOCIATION. Proceedings of the. At the Annual Meeting, from 1861-1874. 1 vol. 8vo.
 CALEF, JOHN. Boston Gazette, 1805, 1806. 2 vols. folio.
 CHASE, ANNE A. Journals of Madam Knight and Rev. Mr. Buckingham, written in 1704-1710. 1 vol. 8vo.
 COLE, MRS. N. D. Salem Gazette, July-Dec., 1875.
 COOK, JAMES. Miscellaneous pamphlets, 17.
 EMILIO, L. F., OF SAN FRANCISCO, CAL. Report of the San Francisco Park Commissioner, 1874-75. 8vo, pamph.
 GREEN, S. A., OF BOSTON, MASS. Little Wanderer's Advocate, 1872. 1 vol. 8vo. Miscellaneous pamphlets, 7.
 GREENWOOD, ISAAC J., OF NEW YORK. The Willoughby Family of New England. 8vo, pamph., 1876.
 JENNISON, O. A., OF LANSING, MICH. City Directory, 1853, 1854. 1 vol. 8vo.
 KIMBALL, JAMES. Cape Ann Advertiser, Dec. 3, 10, 17, 24, 31, 1875.
 LEE, JOHN C. Commercial Bulletin, Oct. 30, Nov. 6, 20, 27, Dec. 4, 1875.
 MERRITT, L. F. Essex Co. Mercury, Dec., 1875.
 PERRY, W. S., OF GENEVA, N. Y. Journal of the General Convention of the Protestant Episcopal Church in the U. S., 1874. 1 vol. 8vo.
 PUTNAM, F. W. Paper on Cylinder Condensation, by G. B. Dixwell. 8vo pamph.
 ROPES, W. L., OF ANDOVER, MASS. Catalogue of Andover Theological Seminary, 1875-6. 8vo, pamph.
 SHIPMAN, WM. R., OF COLLEGE HILL, MASS. Catalogue of the Officers and Students of Tufts College, 1875-6. 8vo, pamph.
 U. S. PATENT OFFICE. Official Gazette, Nov. 16, 23, 30, Dec. 14, 23, 1875.
 WATERS, J. LINTON. Miscellaneous pamphlets, 5.

By Exchange.

- AMERICAN ANTIQUARIAN SOCIETY. Transactions of. Vols. v, vi. 2 vols. 8vo.
- BOSTON SOCIETY OF NATURAL HISTORY. Proceedings of. Vol. xviii, sigs. 9, 10, 11, 1875.
- CAEN, FRANCE, ROYALE ACADEMIE DES SCIENCES, ARTS ET BELLES-LETTRES. *Memoires*, 1876. 1 vol. 8vo.
- CANADIAN INSTITUTE. *Journal*, Vol. xiv, No. 6, Dec., 1875.
- CROSSE ET FISCHER. *Journal de Conchyliologie*. Tome xv, No. 3, 1875.
- DRESDEN, NATURWISSENSCHAFTLICHE GESELLSCHAFT Isis. *Sitzungs-Berichte* Jahrg. 1874, Oct.-Dec.
- MICHIGAN STATE LIBRARY. *Joint Documents*, 1842, 1843, 1844, 1850, 1851, 1853, 1854, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869. *Laws of Michigan*, 1845, 1847, 1858, 1861, 1862, 1867, 1869, 1870, 1871, 1872. *Senate Documents*, 1853, 1855, 1857, 1859, 1861, 1863, 1865. *House Journal*, 1849, 1858, 1859, 1861, 1863, 1864, 1865, 1867, 1869, 1870, 1871. *Senate Journal*, 1850, 1857, 1858, 1859, 1861, 1863, 1864, 1865, 1867, 1869, 1870. *Senate and House Documents*, 1843, 1853, 1862, 1867, 4 vols. 8vo. *Revised Statutes of Michigan*, 1 vol. 8vo. *Geological Survey of Michigan*, 1860, 1 vol. 8vo. *Census of Michigan*, 1874, 1 vol. 8vo. *Statistics of Michigan*, 1870, 1 vol. 8vo. *Catalogue of Michigan State Library*, 1875-76, 1 vol. 8vo. *State Board of Health*, 1873-1874, 2 vols. 8vo. *Registration Reports*, 1 vol. 8vo. *Michigan Pomological Society*, 1871-72, 1873, 1874, 4 vols. 8vo. *Michigan Board of Agriculture*, 1865, 1866, 1867, 1870, 1871, 1872, 1873, 1873-4, 7 vols. 8vo. *Michigan Insurance Reports*, 1871, 1872, 1873, 4 vols. 8vo. *Compiled Laws*, 2 vols. 8vo. *Convention Journal*, 1867, 1 vol. 8vo. *Edmund's Impeachment Trial*, 2 vols. 8vo. *Michigan School Reports*, 1865, 1866, 1869, 1871, 1872, 5 vols. 8vo. *Report of Superintendent of Public Instruction*, 1873, 1 vol. 8vo. *Public and Local Acts of Michigan*, 1874, 1 vol. 8vo. *Public Acts*, 1875, 1 vol. 8vo. *Local Acts*, 1875, 1 vol. 8vo. *Convention Debates*, 1867, 2 vols. 4to. In all 178 volumes, and 75 Miscellaneous Pamphlets.
- MICHIGAN GEOLOGICAL SURVEY. Vols. i, ii, 1869-1873, 2 vols. 8vo, Maps.
- N. E. HISTORIC-GENEALOGICAL SOCIETY. *Register*, Jan., 1876. *Diary of Dr. Ezra Green*. *Centennial Orations*, 1874-1875, 1 vol. 8vo.
- PARIS, FRANCE, INSTITUT HISTORIQUE. *L'Investigateur* Mai-Août, 1875.
- PARIS, SOCIÉTÉ D'ACCLIMATION. *Bulletin Mensuel*. Tome ii, 3e Serie. Mai, Sept., 1875.
- PARIS, SOCIÉTÉ D'ANTHROPOLOGIE. *Bulletins*. Tome ix, 11e Serie. Mai, Nov., 1874.
- PUBLISHERS. *American Journal of Science and Arts*. *American Naturalist*. *Beetle and Wedge*. *Boston Daily Globe*. *Bradford New Era*. *Haverhill Gazette*. *Ipswich Chronicle*. *Lawrence American*. *Lynn Reporter*. *Lynn Transcript*. *Nation*. *Nature*. *Salem Gazette*. *Salem Post*. *Salem Register*. *Gardener's Monthly*. *Gloucester Telegraph*. *Lynn City Item*. *Peabody Press*. *Salem Observer*. *Medical and Surgical Reporter*. *Turner's Public Spirit*.

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BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 8. SALEM, MASS., FEBRUARY, 1876. No. 2.

One Dollar a Year in Advance. Ten Cents a Single Copy.

REGULAR MEETING, MONDAY, FEBRUARY 7, 1876.

Meeting this evening. The PRESIDENT in the chair.
Records read.

Mr. S. G. W. BENJAMIN of Boston gave a lecture on "The Theory and Practice of Art," which was attentively listened to by a large and appreciative audience.

The high expectations which the lecturer's reputation as a writer had excited, were not disappointed. The paper presented was an eminently able and finished production, giving, in terse and attractive style, a vast deal of information to the uninitiated in art matters.

The lecturer commenced with a brief statement of the development of interest in the fine arts, in America, during the last quarter of a century, and warmly commended the progress that had been made. But by the very rapidity of that progress we are in danger of being super-

ficial, a danger to be guarded against by understanding the real character and scope of art.

Art was defined as the offspring from the poetic yearnings and emotions suggested by aspirations after the true, the good, and the beautiful. In the strict meaning of the term, it is the appeal to the imagination through the eye, by means of external forms. Religious architecture has been in the past the first of the arts to receive attention. Sculpture follows and then the arts of design. Only the highest art is cosmopolitan. The criticism was passed upon French art that it confines itself to the expression of the beautiful, while the Germanic races make place for the moral element. The IDEAL is the ultimate aim of art, and no technical excellences can atone for its absence. The fine arts and the industrial arts, it was claimed, stand on the same level, when the expression of the beautiful is the common aim. Cellini is no more an artist when he executes his silver statue of Perseus, than when he designs his silver salt cellar for Francis First. The limitations and modes of art were next discussed. The plastic arts and the arts of design constitute the two grand divisions. The three grand limitations are form, light and shade, and color. The arts of design include form, color, and light and shade, and, requiring for their perfection the whole art triad, deservedly take the highest rank.

Color was declared to be the EMOTIONAL element in painting. In some people it awakens the same feelings as music. Scarlet is the emblem of rage. Turner added awful significance to his picture of the slave ship, throwing slaves overboard, by representing the sun, the hue of blood, sinking low down over a gray waste of angry sea. Black and white are hues in harmony with our more solemn emotions. Color appeals more to the soul than to the intellect. A scientific knowledge of chromatic

effects is essential, and comes only as the result of study, observation and practice.

In the application of these fundamental principals of the arts of design to practice, four points are to be mastered : perspective, tone, values, and composition. Perspective is linear and aerial ; the former founded upon the convergence of imaginary geometric lines, the latter a matter of feeling and observation. Tone is a term borrowed from music, suggested by the limited power of material colors to give the impression of light. White is the starting point, and everything in the picture has to be pitched on that key. The stronger the effect required, the lower must be the tone. The term "values" is used to indicate the equilibrium between a given effect and the materials at command. Only great artists can disregard them with safety. Composition is the application of all these principles to the conception of a work of art. Examples were given of artists who had excelled in each or all of these particulars. Artists as a whole are agreed upon these theories, but differ when they come to reduce them to practice ; and on this point a very sharp and deserved criticism of many art critics was given. The least diversity between theory and practice is found in the plastic arts. In regard to the arts of design there is endless controversy. A consideration of the comparative merits and demerits of water colors and oil pigments followed, and the excellences of each stated, the large preference in point of dignity and durability being given to paintings in oil. In this department every great artist has his own method of employing colors.

The lecturer then explained the importance of careful study and application, while at the same time the superhuman power of real genius was admitted. This point was exquisitely illustrated by a description of a church

spire in Brittany, "a tower from whose floor one looks up to the finial at the extreme top, through a hollowed shell of stone tracery work three hundred feet high, entirely clear of brace or buttress, pier, beam, or bracket, nothing to break the astonishing sight but the doves flying in the dizzy cavity, and the sun flashing here and there through the open carvings, while the wind breathes, from age to age, a grand æolian chant through that organ of granite."

The comparative merits of painting from models, or from memory and imagination, received attention, and great stress was laid upon the importance of proficiency in drawing, before attempting to work in colors. The proper canons of art criticism and judgment on the part of the general public were very succinctly and fairly stated. It should be unprejudiced, and take into account the artist's purpose, with constant remembrance that we may be tempted to condemn what is really admirable in its way, but not addressed to our personal taste, which may be one-sided and partial.

The lecture closed with a brilliant characterization of art, as the embodiment of the "life blood of master spirits," as a historic record, giving events an immortality in form and color, and as a minister to man's highest nature. It was finely written, and well delivered, and those who were not present may comfort themselves with the thought that they missed one of the most exhaustive and instructive lectures that has ever been given in Salem.

W. H. Simonds, Jr., of Salem, and E. P. Robinson of Saugus were elected resident members.

REGULAR MEETING, MONDAY, FEBRUARY 21, 1876.

MEETING this evening. The PRESIDENT in the chair.
Records read.

The new draft of the By-laws was read, as follows :—

ARTICLE I. — MEMBERS.

SECTION 1. Any person may be elected a member, at a Regular Meeting by a majority of the members present and voting, the name of such person having been proposed in writing by two members at a previous meeting.

SECT. 2. Any person not residing in the County of Essex may be elected a corresponding member upon nomination by the Board of Directors, but corresponding members shall not be eligible to office, or entitled to vote. Any member removing from, or residing out of the county, may become a corresponding member, by giving notice of his intention and paying all arrears.

ARTICLE II. — OFFICERS.

SECTION 3. The officers shall be a President, four Vice-Presidents, a Secretary, a Treasurer, an Auditor, a Librarian, and Curators of Departments who, with the Chairmen of the Standing Committees, shall be the Board of Directors.

SECT. 4. The Board of Directors may appoint an Associate Curator of any department upon nomination of the Curator of the same department; and may appoint an Assistant Librarian, upon nomination of the Librarian. But the appointment of such Associate or Assistant, shall not make him a member of the Board of Directors.

SECT. 5. The Board of Directors may at any time remove an Associate Curator or Assistant Librarian.

ARTICLE III. — COMMITTEES.

The following Committees shall be chosen at the Annual Meeting :

SECTION 6. A Finance Committee (of which the President shall be *ex officio* Chairman, and the Treasurer *ex officio* a member), to have the direction of the funds of the Institute, in accordance with the Act of Incorporation, and of such investments of funds as may be necessary.

SECT. 7. A Library Committee (of which the Librarian shall be *ex officio* a member), who shall make an annual examination of the condition of the Library.

SECT. 8. A Committee on Publications, who shall have the management of all publications of the Institute, and regulate the manner of their distribution.

SECT. 9. A Lecture Committee, who shall have charge of all lectures and public meetings, except such as may be held or given for the benefit of a special department of the Institute, and except Field Meetings.

SECT. 10. A Committee on Field Meetings (of which the Secretary shall be *ex officio* Chairman) who shall determine when and where Field Meetings shall be held, and shall have the general management of the same.

SECT. 11. Each of these Committees, unless herein otherwise provided for, shall choose a Chairman, whose election shall be immediately certified to the Secretary, and such election shall constitute him a Director.

SECT. 12. The several Committees shall report at the Annual Meeting.

ARTICLE IV. — DEPARTMENTS.

The Management of the Institute shall be divided into the following Departments:—

SECTION 13. The Department of History, which shall include Historical Materials and Antiquities.

SECT. 14. The Department of Manuscripts.

SECT. 15. The Department of Archæology, which shall include Ethnology.

SECT. 16. The Department of Numismatics.

SECT. 17. The Department of Geology, which shall include Mineralogy, and Palæontology.

SECT. 18. The Department of Botany.

SECT. 19. The Department of Zoölogy.

SECT. 20. The Department of Horticulture.

SECT. 21. The Department of Technology.

SECT. 22. The Department of Music.

SECT. 23. The Department of Art, embracing Painting, Sculpture, and Engraving.

ARTICLE V. — MEETINGS.

SECTION 24. Regular Meetings shall be held on the first and third Mondays of each month, at the Rooms of the Institute, at 7½ o'clock, P. M. The second meeting in May shall be the Annual Meeting.

SECT. 25. Special Meetings may be called by order of the President, or at the written request of five members. Business to be transacted at a special meeting shall be limited to the subjects stated in the call.

SECT. 26. Field Meetings shall be held at such times and places as the Field-meeting Committee may designate.

SECT. 27. The Board of Directors shall meet on the first and third Mondays of each month, at 7 o'clock, P. M., at the Rooms of the Institute, and at such other times as they may be called together by the President.

SECT. 28. Five members shall be a Quorum for holding any meeting of the Institute, or of the Board of Directors, but any less number, of whom the Secretary shall be one, may have power to adjourn the meeting.

SECT. 29. Officers shall be elected at the Annual Meeting, but vacancies may be filled by election at any Regular Meeting.

SECT. 30. All Elections shall be by ballot, and by a majority of the members present and voting.

ARTICLE VI. — DUTIES OF OFFICERS AND COMMITTEES.

SECTION 31. The President, or in his absence one of the Vice-Presidents, shall preside at all meetings of the Institute, and of the Board of Directors. The President shall be *ex officio* Chairman of the Finance Committee.

SECT. 32. The Secretary shall give notice of all meetings and record their proceedings; shall notify all members and officers of their election; shall have charge of all papers and documents relating to the general business of the Institute; shall conduct the general correspondence; and shall report the doings of the Institute during the year, at the Annual Meeting. He shall acknowledge the receipt of all donations except those to the Library. He shall record in a book kept for that special purpose the By-laws of the Society and the names of its members, with the date of their election, and whenever any alteration, amendment, or repeal of the By-laws is made, the same shall be entered in said book. He shall be *ex officio* Chairman of the Field-meeting Committee, and shall perform such other duties as the Board of Directors shall from time to time designate by vote.

SECT. 33. The Treasurer shall be *ex officio* a member of the Finance Committee, and shall keep an exact account of all his receipts and expenditures, and shall submit his report, after examination by the Auditor, at the Annual Meeting.

SECT. 34. The Auditor shall audit all accounts of the Treasurer, Curators and Committees, and shall report at the Annual Meeting.

SECT. 35. The Librarian shall be *ex officio* a member of the Library Committee. He shall receive, and have the custody of, all books and other printed works, maps, charts, and diagrams of the Institute; shall attend to their arrangement, cataloguing and preservation; shall conduct the correspondence relating to the Library and acknowledge all

donations thereto; and shall report on its condition at the Annual Meeting.

SECT. 36. The Library Committee shall divide the books, and other articles, belonging to the Library, into two classes; namely, (A) those which are not to be removed from the building, except upon the written permission of the Library Committee; (B) those which may circulate under such rules as may be prepared by the Library Committee, and approved by the Board of Directors, which rules shall have the force of By-laws. A copy thereof shall be pasted on the cover of each volume.

SECT. 37. The Board of Directors shall have full power to transact all the general business of the Institute, except the election of members and officers; and may, when they deem it best, refer any matter to the general meeting of the Society for its action. They shall decide, subject to the control of the Society, how and when the general resources of the Society, not devoted to any particular department, shall be expended; and shall assign all space or location of specimens for each Department, and shall determine all questions that may arise between any of the Curators.

SECT. 38. The Curators shall have charge of their respective Departments, and shall have full power relating to the collection, care and preservation of the specimens or materials relating thereto: provided, however, that any alteration of the general plan or principle of arrangement of any department and the removal of specimens or other material except for the purpose of exchange, shall be made only with the consent of the Board of Directors, or under such regulations as they may, from time to time, prescribe. Curators shall have charge of all Lectures, Exhibitions, or Entertainments, given for their respective Departments. All moneys or funds that may at any time be raised by any Curator, or that may come into his hands for the benefit of his Department, and the net proceeds of any Lecture, Exhibition or Entertainment under his charge, shall be deposited by him with the Treasurer, who shall give him a receipt therefor, and place the amount to the credit of that Department. Each Curator shall have authority to draw upon the Treasurer from time to time, for the purposes of his Department, to the amount standing to its credit; excepting, however, such funds as may be permanently invested, of which the income only, shall be subject to such authority. Each Curator shall report on the condition and wants of his Department, at the Annual Meeting.

ARTICLE VII. — ASSESSMENTS.

SECTION 39. An assessment of three dollars shall be paid by every member on admission, and annually thereafter on the third Monday in May.

SECT. 40. No member who shall be in arrears for one year shall be entitled to vote or hold any office; and any member so in arrears, who shall refuse or neglect to pay his dues for six months after being notified thereof by the Treasurer, by written notice duly recorded, shall cease to be a member of the Institute. *Provided*, however, that any member may, in lieu of the annual assessment, pay the sum of *thirty dollars*, to be added to the funds of the Institute, the annual interest thereof to be considered as the payment of the annual assessment of said member.

SECT. 41. Members elected more than four months, and within eight months after an Annual Meeting, shall have one dollar deducted from the next annual assessment; and members elected eight months or more after an Annual Meeting, shall have two dollars deducted from the next annual assessment.

SECT. 42. The President and Treasurer may exempt members from assessments, when they may deem it for the interest of the Society.

ARTICLE VIII. — APPROPRIATIONS.

SECTION 43. No Member, Officer, or Committee, except the Board of Directors, shall incur any debt whatever in the name of the Institute; but whenever money shall be expended under any appropriation, an account of receipts and expenditures, with the vouchers therefor, shall be rendered to the Treasurer by the party having the same in charge, and the net receipts, if any, shall be paid into the Treasury within thirty days after the object for which the appropriation was made shall have been accomplished.

SECT. 44. When no appropriation shall have been made, a statement of all receipts and expenses incurred shall be made to the Treasurer in like manner; and when all bills shall have been paid, the net receipts shall be turned over to the Treasurer, unless it have been otherwise previously ordered by the Board of Directors. The Board of Directors may, in either case above named, in the name of the Institute, assume all liability for any such debt as may be outstanding, when the balance of said receipts shall have been placed in the Treasurer's hands; provided they are satisfied that the gross receipts exceed all expenses incurred by the party in charge, and that the business or entertainment has been previously authorized by the Institute or the Board of Directors.

ARTICLE IX. — ROOMS.

SECTION 45. The Rooms shall be open to members and the public at such times and under such regulations as the Directors may determine.

SECT. 46. Visitors may be introduced by any member.

ARTICLE X.—AMENDMENT OR ALTERATION OF BY-LAWS.

SECTION 47. The By-laws may be altered, repealed or amended by the votes of two-thirds of the members present and voting, at a Regular Meeting, notice of the proposed alteration, repeal or amendment, having been given in writing at a previous Regular Meeting.

The **SECRETARY** announced the following correspondence :—

From **American Antiquarian Society**, Jan. 22; **E. T. W. Baker**, Dorchester, Feb. 11; **S. G. W. Benjamin**, Boston, Jan. 23, Feb. 9; **N. H. Chamberlain**, Cambridge, Feb. 9; **C. F. Crocker**, Lawrence, Feb. 11; **Frank M. Etting**, Philadelphia, Penn., Feb. 10; **V. A. de Gourguez**, Bordeaux, Jan. 25; **R. M. C. Graham**, New York, Jan. 21; **J. C. Holmes**, Detroit, Mich., Jan. 4; **T. H. Johnson**, Jan. 6; **D. B. Kimball**, Jan. 4; **A. E. Knight**, Dec. 27; **E. D. Marchant**, Boston, Feb. 17; **John T. Moulton**, Lynn, Jan. 4, Feb. 18; **J. Munsell**, Albany, N. Y., Jan. 29; **J. D. Philbrick**, Boston, Dec. 30; **Rantoul Literary Society**, Rantoul, Ill., Jan. 19; **E. P. Robinson**, Saugus, Feb. 11; **John Robinson**, Jan. 19; **St. Petersburg**, Jardin Imperial de Botanique, Dec. 19; **Salem**, Ladies Centennial Committee, Jan. 8; **Horace N. Smith**, Jan. 5; **M. E. Williams**, Jan. 27.

The **LIBRARIAN** reported the following additions :—

By Donation.

- BLECK, E. F., OF BETHLEHEM, PA.** Miscellaneous pamphlets, 9.
CUTLER, A. E., OF CHARLESTOWN, MASS. Report of the Managers of the Winchester Home Corporation, Jan., 1876. 8vo pamph.
FROTHINGHAM, RICHARD. The Battle Field of Bunker Hill. 8vo pamph.
GREEN, S. A., OF BOSTON, MASS. Miscellaneous pamphlets, 6.
HOLMES, JOHN C., OF DETROIT, MICH. The Detroit Conglomeration, Jan. 21, Feb. 1, 2, 3, 4, 5, 7, 1876.
HUMPHREYS, A. A. OF WASHINGTON, D. C. Report of the Chief of Engineers, 1875. Vols. I, II. 2 vols., 8vo.
HUNT, MRS. T. U. S. Naval Astronomical Expedition. 2 vols., 4to. Report on the U. S. and Mexican Boundary. 1 vol., 4to. Miscellaneous pamphlets, 50.
HUNT, T. F. Log Books, 2.
KIMBALL, JAMES. Dialogues on Theology, by D. N. Prima. 1 vol., 12mo. Cape Ann Advertiser, Jan. 7, 14, 21, 28, Feb. 4, 11, 1876.
LEE, FRANCIS H. Miscellaneous pamphlets, 45.
MANNING, E. C. Boston Advertiser for Jan., 1876.
PALFRAT, C. W. Miscellaneous pamphlets, 58.
ROBINSON, JOHN. Miscellaneous pamphlets, 112.
THOMPSON, CHAS. P., M. C. Wilson's Report on the Credit Mobilier. 1 vol., 8vo. Report Poland Committee. 1 vol., 8vo. Smithsonian Report, 1874. 1 vol., 8vo. Report of the Commissioner of Education, 1874. 1 vol., 8vo.
U. S. BUREAU OF NAVIGATION. Astronomical and Meteorological Observations for 1873. 1 vol. 4to.
WATERS, J. L. Miscellaneous pamphlets, 15.
WILLIAMS, JAMES, OF COLUMBUS, OHIO. Report of the Auditor of State, 1875. 1 vol., 8vo.

By Exchange.

AMERICAN PHILOSOPHICAL SOCIETY. Proceedings of. Vol. xiv, No. 95. June-Dec., 1875.

AMERICAN GEOGRAPHICAL SOCIETY. Bulletin, 1875-76. No. I.

BOSTON PUBLIC LIBRARY. Bulletin for January, 1876.

BOSTON SOCIETY OF NATURAL HISTORY. Proceedings. Vol. xviii, Jan., 1876.

BUFFALO SOCIETY OF NATURAL SCIENCES. Bulletin. Vol. iii, No. II. 1875-6. 8vo.

DRESDEN, NATURWISSENSCHAFTLICHEN GESELLSCHAFT-ISIS. Sitzungs-Berichte Jahrg., 1875. Jan.-Juni.

DRESDEN, VEREIN FÜR ERDKUNDE. xli Jahresbericht. 1875.

EMDEN, NATURFORSCHENDEN GESELLSCHAFT. Sechzigster Jahresbericht, 1874. 8vo.

HARVARD COLLEGE. Report of the President and Treasurer of, 1874-75.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY. Annual Report, 1874-5.

LIVERPOOL LITERARY AND PHILOSOPHICAL SOCIETY. Proceedings. No. xxix. 1874-75.

LONDON ROYAL SOCIETY. Proceedings of. Vol. xxii. Nos. 151-155. Vol. xxiii. Nos. 156-163. 1874-75.

NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Proceedings of the. Jan. 5, 1876. Brief History of the, N. E. Historic-Genealogical Register, 1847-76.

N. Y. GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Record. Vol. vii, No. 1. Jan., 1876.

N. Y. STATE LIBRARY. Report of the Trustees of the. 1874. 1 vol., 8vo. Report of the Regents of the University, 1874. 1 vol., 8vo. Report of the Regents of the University on the boundaries of the State of N. Y., 1873. 1 vol., 8vo.

PEABODY ACADEMY OF SCIENCE. Memoirs of the. Vol. i, No. IV. Dec., 1875.

SOMERSETSHIRE ARCHEOLOGICAL AND NATURAL HISTORY SOCIETY. Proceedings for 1874. Vol. xx. 1 vol., 8vo.

STOCKHOLM, KÖNIGLIGA SVENSKA VETENSKAP-AKADEMIEN. Handlingar, Band 9, 10, 12, 1870, 1871, 1873. Oversigt, Vol. 20, 22, 30, 1871-1872-1873. Bihang, Band I, No. 1, 2, 1873; Band II, No. 1, 2, 1873. Lefnads-teckningar, Band Hefte 3, 1869-73.

ST. GRAVENHAGUE, ENTOMOLOGICAL SOCIETY OF THE NETHERLANDS. Tijdschrift Voor Entomologie, Vol. 17, 1873-74.

THRONDJEM KÖNIGELIGE NORRKE VIDENSKABERS-SELSKAB. Aarsberetning for 1874.

UPSAL SOCIÉTÉ ROYALE DES SCIENCES. Nova Acta. Ser. iii, Vol. ix, Fasc. I, II, 1874-1875. Bulletin, Vol. v, Nos. 7-13, 1873. Vol. vi, 1874.

VERMONT HISTORICAL SOCIETY. Governor and Council. Vol. 3, 1782-1791. 1 vol., 8vo.

VERMONT STATE LIBRARY. Senate Journal, 1874. 1 vol., 8vo. House Journal. 1874. 1 vol., 8vo. Transactions Dairymen's Association, 1875. 1 vol., 8vo. School Laws of Vermont, 1875. 1 vol., 8vo.

WISCONSIN STATE HISTORICAL SOCIETY. Annual Report, 1876.

PUBLISHERS. American Journal of Sciences and Arts. American Naturalist. Beetle and Wedge. Boston Daily Globe. Bradford New Era. Gardener's Monthly. Gloucester Telegraph. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn City Item. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Salem Gazette. Salem Observer. Salem Post. Salem Register. Turner's Public Spirit.

The PRESIDENT introduced Rev. N. H. CHAMBERLAIN, of Cambridge, who delivered an entertaining lecture on

"The way of making orators." Mr. Chamberlain traced the history of oratory and public speaking from an early age to the present time, and in this connection gave a brief but interesting sketch of the life of Francois Delsarte, the founder of "the Practical School of Æsthetics and Art" in Paris, which was very celebrated; reciting particularly some of the incidents of Delsarte's early days, his many bitter struggles and disappointments, the success that attended his first appearance on the stage, his subsequent brilliant career as a singer and actor until an impaired voice compelled him to retire; the subsequent devotion to his studies and to the establishment of his school. Delsarte was a descendant of the Delsartos of Italy; born in the north part of France, Nov. 11, 1811, died July 20, 1871.

The lecturer claims to be a believer in Delsartism, and said it had been called a science, and in his opinion justly. Mr. Chamberlain gave several short readings and recitations showing the difference between a correct and faulty rendering of the various passages.

At the close of the lecture on motion of Mr. W. P. UPHAM, a vote of thanks was passed to Mr. Chamberlain for the lecture delivered this evening.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 8. SALEM, MASS., MAR., APR., MAY, 1876. Nos. 3, 4.

One Dollar a Year in Advance. Ten Cents a Single Copy.

REGULAR MEETING, MONDAY, MARCH 6, 1876.

Meeting this evening. The PRESIDENT in the chair.
Records read.

WILLIAM P. UPHAM, Esq., read a very interesting
paper narrating

INCIDENTS DURING THE OCCUPANCY OF BOSTON BY THE BRITISH TROOPS IN 1775-6.

These incidents were gleaned from many family letters, journals, diaries, etc., that had recently come into his possession, or had been loaned to him for the preparation of this paper.

Among them were many letters written at that period to Oliver Wendell, a merchant in Boston at the time of the Revolution. Mr. Wendell was in consultation with the early patriots of the Revolution, and contributed to the country's liberty and independence. He was for some time one of the Selectmen of Boston, was often a mem-

ber of the Senate and of the Council under the Constitution, and was for many years the Judge of Probate for the County of Suffolk. He was residing, January 1, 1775, on the corner of School Street opposite the King's Chapel.

The shutting up of the port of Boston by the Boston Port Bill, June 1, 1774, produced the greatest suffering and distress, and aroused the intensest indignation throughout the whole country. The people could not submit; there was a feeling that the evils of war were imminent; "and a gloom settled upon the inhabitants of Boston and the surrounding towns which is reflected from the correspondence and journals of the time." On the 19th of April, 1775, all intercourse between the people of Boston and the country was cut off by order of Gen. Gage; but on the 22d an agreement was made that the inhabitants might, upon surrendering their arms, "leave the town with their families and effects, and those who remained might depend upon the protection of the Governor." Gage subsequently violated this agreement, at first obstructing such removals and finally denying passes for that purpose.

A century has passed since the occurrence of the facts which were here recited, and although our country, during that interval, has several times been engaged in war, especially in the recent civil conflict (1861-65), yet the scenes have been so far removed from our hearth and homes that we know but little of its direful effects, and consequently can scarcely realize the trying events that our ancestors were encountering at the opening of the Revolutionary struggle, the centennial anniversaries of the leading events of which are now in process of a due commemoration by a grateful posterity. Much has been written on these subjects, and the admirable work of

Hon. Richard Frothingham on the Siege of Boston seems to be almost exhaustive, yet the recital of the daily notes and record of events, either in letters between members of the same family, or those engaged in close business connections, or in diaries, give an insight into the inner life of the people which has necessarily escaped, to a certain extent, the notice of the historian or the annalist.

Mr. Upham spoke about an hour and was listened to with marked attention by an appreciative and large audience.

The PRESIDENT, Mr. A. C. GOODELL and others, spoke in continuation of the subject, and expressed much interest in the communication, which was referred to the appropriate committee for publication in the Historical Collections of the Institute.

The new draft of the By-laws was passed through its second reading.



WEDNESDAY, MARCH 8, 1876.

THIS evening, A. H. JOHNSON, M. D., gave the first of his series of lectures

ON THE RELATION OF MIND TO THE NERVOUS SYSTEM.

The lecture, which was mainly introductory, presented such anatomical details, illustrated by diagrams, as were necessary to the full comprehension of the lectures to follow. The diagrams alone, exhibiting the comparative anatomy of a dozen brains of different animals, furnished conclusive evidence for the speaker's theory, that mental power generally corresponds to the size and quality of the cerebrum. The doctor confined himself closely to facts, and wasted no time whatever over theories, and his lec-

tures will do much good by attracting attention to the subject, and furnishing indisputable facts.

Our conception of a human being, the lecturer said, necessarily embraces not only a mind with its characteristics, but also a physical frame with its attributes and accomplishments. The animal and the spiritual, the physical and the mental, whatever may be the degree of their distinctness, the measure of their independence, or the method of their connection, are indisputably united. "What God hath joined together, let no man put asunder." If one would understand the laws and workings of the human mind, he should study it in its connections with the body with which it is so intimately blended. It is in such a study that the lecturer proposed to offer a little help. An intelligent discussion of physiological facts presupposes some knowledge of anatomy. To insure a clear understanding of the facts with which we are especially to deal, it is necessary to somewhat particularly describe the structure and operations of the nervous system.



WEDNESDAY, MARCH 15, 1876.

THIS evening was given the second of Dr. JOHNSON'S series of lectures. In continuation of the physiological portion of his subject, the lecturer brought forward facts to show that the functions of the brain must largely depend upon the character of its blood supply. From these and facts adduced at the previous lecture it appears that some thought does not require us to suppose it to be the activity of a soul using the brain as an instrument.

He assumed that it was generally conceded, that the mental faculties of animals are not the manifestations of

a spiritual nature. Since the human brain, the special organ for intelligent life in animals, appears in a much more highly developed form in man, we are justified in considering it capable of producing mental phenomena of a higher grade and perfection. That we have, in addition to the physical mental faculties which we hold in common with the lower animals, a spiritual nature, which merges in, harmonizes with and controls them, and that this spiritual nature, together with the experience it gains through connection with our physical bodies is imperishable, is a truth of revelation.

The lecturer then copiously illustrated the automatic action of the brain, some of the conditions under which it occurs, and its effects in the production of illusions, through its action upon the sensorium (or ganglia at the base of the brain), as explained by Dr. Carpenter.

The inhibitory action of the brain, first demonstrated by Brown Sequard, was then explained and discussed with special reference to the inhibitory action of predominating thoughts.

Turning from the more strictly physiological portion of his theme, the lecturer sought first to remove objections to the facts he had presented, raised by those who fear that they may be used to remove moral responsibility by representing man as a mere product of material forces.

He showed that physiological facts do not and cannot deny the existence of a soul, nor do they account for the soul's origin or existence.

Whether a large number of our mental faculties have been prepared for us by the slow process of development and evolution, is immaterial.

The *product* and its *future* we esteem above the manner in which it came into existence.

REGULAR MEETING, MONDAY, MARCH 20, 1876.

MEETING this evening. The **PRESIDENT** in the chair.
Records read.

MR. JOHN ROBINSON gave an interesting and instructive lecture

ON FERNS.

Mr. Robinson has made the study of ferns a specialty, and has in his greenhouse an extensive collection, specimens from which were exhibited, much to the gratification of the attentive audience.

Mr. Robinson commenced by stating in what part of the vegetable kingdom the ferns stood, as compared with other plants, particularly those called flowerless, or Cryptogams. He said it was difficult to draw the line between the various orders of this great class of plants, and that they can hardly be separated from the flowering plants by any clear line, as the higher orders of the cryptogams approach so nearly the lower orders of flowering plants. Commencing with the spore, or seed, it was followed through all its stages of growth. The root, stem, and fronds were duly considered; the different modes of fruiting were spoken of and compared; and in closing an account was given of the natural distribution of ferns and the places most favorable to their production and growth.

The lecture was illustrated by excellent diagrams, and also by living specimens of tropical ferns.

Messrs. T. J. Hutchinson and William S. Hutchinson of Salem and M. M. N. Fiske of Ipswich were elected members.

The new draft of the By-laws having been read at two

previous regular meetings, passed its third reading and Dr. WM. NEILSON moved :

That the By-laws as now read be accepted and adopted as the By-laws of the Essex Institute, in lieu of the former Constitution and By-laws, which are consequently repealed.

This motion was then put in the form of a vote and was unanimously adopted.



WEDNESDAY, MARCH 22, 1876.

Dr. A. H. JOHNSON gave the third lecture of his course this evening. He said that anxieties arise lest any admission of a physical basis for much of mental life should destroy convictions of man's moral responsibility. Perversions of physiological facts may lead indiscreet persons into a ruinous fatalism. So may a perversion of the doctrine of divine leniency lead some into reckless living. Properly applied, the truths concerning the dependence of mental and spiritual power upon our physical organization more exactly define the limits of moral obligation. While corporeal states and measure of nerve power may determine possibilities and obligations in moral and religious experience, the origin of these bodily conditions enables us to determine when and where to attribute guilt.

A dyspepsia which poisons the whole conception of duty may have been innocently incurred, in which case it will excuse misconceptions of privilege and duty. But if excesses in food, or recklessness as to the time of eating, or a waste of energies have occasioned the disorder, here a point of responsibility for mental depression is found, and also a place indicated at which corrections for

the existing evil should be applied. If in the one case the fact of a morbid state of the body removes the obligation to feel courageous and hopeful, it also indicates in the other case the obligation to use conscientiously the means to maintain bodily health.

A full recognition and wise teaching of the anatomical and physiological relations of the mind, so far from weakening, will on the contrary strengthen the sense of moral responsibility. If by such learning, the range of our responsibility becomes limited in one direction it becomes increased in many others. With a more exact definition of the bounds of obligation, words of comfort and encouragement may change places with words of condemnation, but the moral struggle of the will against perverse inclinations will still go on, although its method may be changed.

Having answered some objections to a statement of the physiological relations of the mind, the lecturer then said that a study of the structure and functions of the nervous system led to conclusions which profoundly affect the relative moral value of various mental experiences. The emotions we have in common with the lower animals. They are the physical response to ideas which originate either from impressions received from external objects or from the mind. They are the excitation of the physical organization. This fact would seem to indicate the low order of emotional experiences in themselves considered. The emotions should not be confounded with the appetites on the one hand, nor the affections on the other. Appetites are desires for some bodily gratification. The affections lie as far above emotions as the appetites do below. Emotions are transient states. Affections are persistent associations of the mind with certain objects and inclinations towards these objects. The very nature of mere

emotion reveals its moral worthlessness. In itself considered it has no more moral significance than muscular spasms. The morality of an emotion depends upon our choices to contemplate the object which calls it into exercise.

After eulogizing the power and value of the emotions in moral and religious reforms, the lecturer said that it was manifest that the temptation to abuse them has a manifold power. The proper order for moral and religious instruction is clearly indicated. We must address our efforts to give and guide thought fitted to excite feelings. To reverse this order is fraught with danger. It is not only to put a mere outward expression in the place of an internal reality, but it is to set loose a force whose intensity we do not know and the direction of whose working may be toward moral disaster instead of moral life.

Having explained and variously illustrated this statement, the lecturer then passed to the discussion of the mystical interpretations which certain morbid and startling disturbances of the mind had received from those who were ignorant of their physical origin. De Quincey's passionate love for the three-years-old daughter of Wordsworth and the visions of her form to which he was subject; Pascal's visions, his belief in their supernatural origin, and the ascetic life he led in consequence; Luther's interviews with Satan and the preposterous conclusions to which they led him,—were adduced to illustrate how nervous disturbances may lead to spectral illusions, while the last two instances show that dangers attend a too ready belief in the supernatural origin of remarkable mental experiences.

These experiences, when they occur in persons whose characters and piety we respect, if they have a reverent form, we are too much inclined to accept as the result

of an extraordinary divine influence. What appears so harmless when endorsed in certain hallowing connections, may, having once obtained high sanction, reveal a widely pernicious influence if its testimony be claimed under other circumstances.



WEDNESDAY, MARCH 29, 1876.

Dr. A. H. JOHNSON's fourth and last lecture on The Relation of the Mind to the Nervous System was delivered this evening.

The lecturer said that the state of the various tissues, fluids, viscera, and functions of the body are almost constant factors in mental products. The customary diet, the habitual practice in the use of food, may have quite as much influence as scholastic training in deciding for a life-time the spirit, methods, and direction in which mental powers shall be exerted. It is not needful to induce all the prominent symptoms of dyspepsia, before the mind will show that things so vulgar as the components of the daily meals are toning, and limiting, and almost dictating its action.

Indifference to literary pursuits, flagging enthusiasm in mental work, impatience in analytic thought, easy, superficial, inefficient study of facts and truths with which one is especially called to deal, are not always indications of defects in *direct* mental training; they may be symptoms of the oppression of various organs which are vainly seeking to rid the body of refuse and superfluous nourishment. Overwork in the digestive organs may produce a more or less complete inhibitory action upon the brain. A certain amount of nervous action is required to carry on the process of digestion.

The mind is likely to be trained according to the measure of elasticity and freedom allowed it after the general functions of the body have appropriated what nerve power they require. The *persistency* of bodily sensations may give them an educational power more potent in deciding spontaneous mental action than the drill of studies.

Among the agencies which very strikingly affect mental power and dispositions is the state of the air by which the body is surrounded. A warm temperature produces its repressive action upon the mind by the effect of heat upon the vasomotor system of nerves. Variations in the *purity* of the air, even more markedly than changes in its temperature, modify the action of the brain. It has been found that eloquent harangues were far from being as efficacious in dispelling apparent spiritual apathy and obduracy, as an abundant supply of fresh air. Drowsy brains, in ill-ventilated rooms, may blunt the points of the most piercing shafts of truth.

Physical exercise, other things being equal, so directly determines the quality, amount and pressure of blood in the head that its effects upon the development and action of the brain become very apparent. Beneficial as physical exercise proves itself to be, if it be too severe, continuous, or prolonged, it may arrest mental activity. So also intense efforts of the mind may arrest physical development. The proper co-ordination of these two departments of nervous life needs a careful consideration. For the highest equable development of both the physical and mental powers, their exercise must be properly proportioned. The special culture of either generally results in the impoverishment of the other. The undoubted healthful influence of gymnastic exercises and athletic sports both upon the mind and upon the body should not

be allowed to blind us to the evils arising from their abuse.

Having illustrated the dependence of mental activity upon the character and quantity of food, upon the purity and temperature of the air, and upon the amount and degree of muscular exercise, the lecturer said that did we realize how largely what we esteem our supremely intellectual life receives influential promptings from functional processes in obscure and despised organs of the body, we should not only be amazed, but be inclined to esteem physical training quite as important as the inculcation of ideas.

The lecturer then passed to speak of the physical basis for the controlling power of thought. Thoughts consume nervous force. Thoughts according to their intensity may have an inhibitory action on each other. If this be so it follows that the best conflict with one's evil propensities is indirect—that is, by immediate exercise of our faculties with thoughts and deeds conscience approves, rather than by attempts to increase the power of the will to rule, by drilling it in direct contests with vicious inclinations. If to expel evil we call in virtuous thoughts to occupy our mental energies, we intensify habits of mental action which will automatically assert their existence, and evil propensities will waste and weaken and perish from disuse.

This course of lectures has been listened to with deep interest, not for entertainment only, but principally to ascertain from a scientific stand-point the "mysterious connection between mind and matter" acknowledged and recognized by all, but capable of full comprehension by those only who are willing to patiently investigate the subject. Dr. Johnson is entitled to gratitude for the light he has thrown upon this important subject.

REGULAR MEETING, MONDAY, APRIL 17, 1876.

MEETING this evening. The **PRESIDENT** in the chair.
Records read.

S. H. Gookin of Salem was elected a resident member.

CHARLES H. HIGBEE gave a familiar lecture on Seaweeds, illustrating his remarks with lantern pictures under the charge of Mr. E. Bicknell. He also exhibited many beautiful and well preserved specimens of pressed seaweeds.

Adjourned.



REGULAR MEETING, MONDAY, MAY 1, 1876.

Meeting this evening. The **PRESIDENT** in the chair.
Records read.

On motion of Mr. A. C. GOODELL :

Voted, That the thanks of the Essex Institute be tendered to Dr. A. H. Johnson for his instructive and profoundly interesting lectures "On the Relation of the Mind to the Nervous System."

On motion of Mr. T. F. HUNT :

Voted, That the thanks of the Essex Institute is hereby tendered to the Ladies' Centennial Committee of Salem for their very generous gift in aid of making an exhibit of the history of Salem at the International Exhibition at Philadelphia, the present season.

Voted, That a committee be appointed to prepare a list of officers for the year ensuing, and to report a printed ballot at the annual meeting, May 15.

Messrs. William Neilson, James Kimball, William D.

Northend, James A. Gillis, and the chair, were appointed on the above committee.

Rev. Richard M. Hodges, of Cambridge, was elected a corresponding member.

Vice President F. W. PUTNAM occupied the evening with an extended discourse

ON THE ANCIENT PERUVIANS.

He stated that he had been led to a special study of the arts and culture of this prehistoric race by the very important and large collection of articles from the ancient graves, tombs and ruins in Peru which had recently come under his charge at the Peabody Museum of Archæology and Ethnology in Cambridge. This most valuable addition to the Museum was collected by Mr. Alexander Agassiz and his assistant, Mr. S. W. Garman, and presented to the Museum by Mr. Agassiz. In the same Museum are many vases and other articles from Peru, presented by the late Professor Louis Agassiz, and obtained during the Hassler Expedition. The Peabody Museum thus contains the most important collection of Peruvian antiquities in this country, and furnishes the means of comparison, not only between the nations of Peru and those of other countries, but also between the ancient peoples of different parts of Peru. For this purpose the large collection of human remains in the Museum, consisting of several hundred skulls and a number of perfect bodies, or "mummies," collected by Mr. Squier and Professor and Mr. Agassiz, is of the greatest importance, and from the study of these remains from different localities, and a comparison of the works of art from the corresponding places, it is evident that there were two contemporaneous tribes or peoples who differed in many respects, and it is also very probable that these

two tribes had come down to historic time, as the Quechua and Aymara tribes, though very much deteriorated and degraded since the Conquest. The Quechuas were probably formed by the union of various small tribes adopting a common language, which Forbes considers as probably founded on the older Aymara. From a study of the arts as shown by the specimens of weaving, etc., and especially of the pottery, it is hardly to be doubted that there was also a much higher development, at what is considered by Forbes as the ancient site of the Aymarass, about Lake Titicaca and especially at Tiahuanaco, all the pottery from this region being far superior in shape, design and execution, as well as generally of a different pattern, from that of the coast. Mr. Agassiz also arrived at the same conclusion from an inspection of the ancient ruins about the lake, and has stated that there is evidence of an intrusion of a later people at various places, as shown by two styles of architecture, one of which has been intruded upon the other. That these ancient people of the lake region were the ancestors of the Aymarass may be probable, but if so, even these Indians which have remained the purest and most isolated of all the Peruvian and Bolivian tribes, must have deteriorated, or have been disturbed in their development toward a higher civilization, even prior to the mythical Inca times. The lecturer here exhibited a large collection of photographs illustrating the several comparisons he had made, and showing the various kinds of architecture as exhibited by the ruins on the islands of Titicaca and Coati, and of several other places; also photographs of different localities in Peru, in order to show the various natural conditions now existing in the several regions whence the collections were obtained by Mr. Agassiz, to whose kindness he was indebted for the use of the photographs on this occasion. A number

of other photographs, taken from specimens presented to the Peabody Museum by Mr. Agassiz, and illustrating the several forms of mummies and the method of burial, were also exhibited. The bodies taken from the tombs, or *chulpas*, in the high Andes, several of which have their heads artificially elongated, were either entirely devoid of covering or had only a braided cord wound about them. Those from the burial places (graves in the sand) near the Pacific coast, at Ancon and Pissagua, were enclosed with cotton, leaves, and various articles, in large bundles or bales of cloth, which were carefully corded and then covered with rushes.

Several crania from the different localities were exhibited, and their characteristics pointed out. Articles of clothing were shown, and also pieces of cloth which had been woven, net and embroidered in many, and often elaborate patterns, some of the pieces being entirely of cotton, others of cotton and wool, and still others probably all of wool. Various other articles were exhibited in order to make more apparent the several facts mentioned by the lecturer. An oil painting, by Mrs. David, was on the stage and was used by Mr. Putnam in illustrating his remarks. This picture had been made by the artist from a group of the articles taken from the graves at Ancon, and beautifully and accurately represented several of the choicest specimens brought from Peru by Mr. Agassiz.

As the special account of Mr. Putnam's Peruvian studies will be published in another connection, only a very general and brief notice of his lecture has been given above. The lecture was listened to throughout with marked attention by a large audience, and the various articles upon the table were afterwards examined with much interest.

The meeting then adjourned.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 8. SALEM, MASS., MAY, 1876. No. 5.

One Dollar a Year in Advance. Ten Cents a Single Copy.

ANNUAL MEETING, MONDAY, MAY 15, 1876.

MEETING this evening at 7.30 o'clock. The PRESIDENT
in the chair. Records read.

The SECRETARY announced the following correspondence:—

From S. F. Baird, Washington, May 8; E. F. W. Baker, Dorchester, Mar. 21; C. F. P. Bancroft, Andover, Mar. 6; A. Graham Bell, Boston, April 10; C. H. Bell, Exeter, N. H., Mar. 3. 14; Brasil, Commission Geologique de l'Empire, Feb. 16; Haydn Brown, West Newbury, May 8; Matthew Cooke, London, Feb. 11; A. W. Corliss, Camp McDowell, Arizona Terr., Feb. 16; F. M. Efting, Philadelphia, Penn., Mar. 4, 18, Apr. 10, 20; M. H. Flisk, Ipswich, May 6; A. C. Goodell, Jr., Mar. 5; Julia Ward Howe, Boston, Mar. 21; S. C. Jackson, State Library, Boston, May 9; O. A. Jenison, Lansing, Mich., Apr. 4, May 4; Kansas Academy of Science, Mar. 11; T. Cushing Ladd, Philadelphia, Apr. 5; J. Francis Le Baron, Boston, May 10; George B. Loring, Feb. 26; Madrid, Observatorio de, Feb. 21; E. S. Mills, Brooklyn, N. Y., Mar. 22; D. Moore, Salem Gas Light Co., May 4; Moscou, Société Imperiale des Naturalistes, Apr. 10; New York Academy of Science, Mar.; W. D. Northend, Apr. 15; Charles Palmer, Ipswich, Feb. 29; Paris, Société d'Anthropologie, Apr. 3; Francis Peabody, Boston, Apr. 6; F. B. Perkins, Boston Athenæum, May 10; J. D. Philbrick, Feb. 25, Mar. 21; Edward Porter, Lexington, Apr. 11; M. A. Porter, Treas. Ladies' Centen. Com., Salem, May 13; Abby S. Richardson, New York, Mar. 7; E. P. Robinson, Saugus, May 1, 9; John Robinson, Feb. 23; Leverett Saltonstall, Boston, Apr. 15, May 4; Sampson, Davenport & Co., Feb. 28, Apr. 1; Hon. Binney Sargent, May 11; Scribner, Armstrong & Co., New York, Mar. 1; Smithsonian Institution, Apr. 15; Richard S. Spofford, Washington, Apr. 11; Charles P. Thomp-

son, M. C., Washington, Feb. 26; C. O. Thompson, Worcester, May 8; A. R. Turner, Jr., Boston, Apr. 4; U. S. Bureau of Education, Mar. 24, Apr. 6; Oliver Warner, State Library, Boston, May 5; William H. Yeomans, Columbia, Conn., Mar. 2.

The LIBRARIAN reported the following additions:—

By Donation.

- ATWOOD, E. S. Miscellaneous volumes, 55.
 BELL, CHAS. H., of Exeter, N. H. Exeter in 1876. 8vo pamphlet.
 BOLLES, E. C. Miscellaneous pamphlets, 7.
 BOSTON, CITY OF. City Documents, 1875. 3 vols., 8vo.
 BUFFALO YOUNG MEN'S ASSOCIATION. Report. Feb. 28, 1876. 8vo.
 BURR, FEARING, of Hingham, Mass. The Town of Hingham in the Civil War, 1861-65. 1 vol., 8vo.
 CONANT, W. P., of West Newbury. The Triumphs of Temper. 12mo. 1804.
 COOK, JAMES P. Report of the Directors and Treasurer of the Maine Central Railroad Company, 1875. 8vo pamph.
 DANE, JOSEPH F. Memoir of Francis Dane. 26 copies.
 DRAKE, S. A., of Boston, Mass. Catalogue of the Library of S. G. Drake. Part I, II. 1876.
 FLANDERS, G. P., of Lowell, Mass. Municipal Register of Lowell for 1875. 1 vol., 8vo. Miscellaneous pamphlets, 4.
 FOOTE, HENRY W. King's Chapel and the Evacuation of Boston. 8vo.
 GARNETT, A. S., of —. Treatise on the Hot Springs of Arkansas. 8vo pamph.
 GILLIS, J. A. Addresses on the Death of J. B. Rice, A. Crocker, S. F. Hussey, Sam'l Hooper. Feb. 20, 1875. 1 vol., 8vo.
 GOODELL, JR., A. C. Miscellaneous pamphlets, 135.
 GOSTORTEN, ALEX., of St. Petersburg. Hebrew Book.
 GREEN, S. A., of Boston, Mass. Fifth Registration Report of Michigan, 1871. 1 vol., 8vo. Miscellaneous pamphlets, 54.
 HARTRANFT, JOHN F., of Philadelphia, Penn. Pennsylvania Archives, 2nd Series, Vol. III. 1 vol., 8vo.
 HARVARD UNIVERSITY, BUSSEY INSTITUTION. Bulletin, Pt. V, 1876. 8vo pamph.
 HIGBEE, CHAS. H. The Royal Blue Book, 1839. 1 vol., 12mo.
 HITCHINGS, E. H., of Boston, Mass. Elements of Chemistry. 1 vol., 8vo. Wayland's Moral Science. 1 vol., 12mo. Boston Directory, 1863-3. 1 vol., 12mo. Notices of Rare Tracts. 1 vol., 12mo.
 HOLDEN, N. J. The Commonwealth for, 1875.
 HOUGH, F. B., of Lowville, N. Y. Historical Sketch of the Mt. Holyoke Seminary, 1876. 8vo pamph.
 HUNT, T. F. Anniversary of the First Religious Society of Newburyport, 1726-1875. 8vo pamph.
 KIMBALL, JAMES. Miscellaneous pamphlets, 9.
 KINGSLEY, J. S. Catalogue of Dean Academy, 1875. 8vo pamph.
 LADIES' CENTENNIAL COMMITTEE OF EXETER, N. H. Exeter in 1876. 8vo pamph.
 LEE, JOHN C. Commercial Bulletin.
 LOWELL, OLD RESIDENT'S HISTORICAL ASSOCIATION. Contributions of, No. II. Feb., 1876. 8vo pamph.
 MCGEARY, JAMES. The Medium and Daybreak, Vol. 6, 1875. 1 vol., royal 8vo 1875-1876. 23 numbers.
 MORSE, E. S. The Orient. 15 numbers.
 PAINE, NATH'L., of Worcester, Mass. Portraits and Busts in Public Building at Worcester, Mass. 8vo pamph.

PRESCOTT, JEREMIAH. Report of the Manager of the Troy & Greenfield Railroad and Hoosac Tunnel. Dec. 31, 1875. 8vo pamph.

POOLE, W. F., of Chicago, Ill. The Ordinance of 1787 and Dr. Manasseh Cutler. 8vo.

PUTNAM, F. W. New York Tribune, Feb., Mar., Apr., 1876.

SALEM, CITY OF. City Documents, 1875. 1 vol., 8vo.

STEVENS, ANNA C. The Climate and Disease of America during the Revolution.

THOMPSON, CHAS. P., M. C. Addresses on the Death of J. B. Rice, etc., Feb.

20, 1875. 1 vol. Addresses on the Death of Wm. A. Buckingham, Feb. 27, Mar. 1,

1875. 1 vol. Mineral Resources West of Rocky Mountains. 1 vol. Revised Statutes relating to District of Columbia. 1 vol.

TOWNE, W. R., of Milford, N. H. Historical Address at Amherst, 1874. 8vo.

TUCKER, JONATHAN. Miscellaneous papers, 40.

U. S. DEPARTMENT OF INTERIOR. Department of the Interior. Circulars of Information of the Bureau of Education. Nos. 1-8. 1875.

U. S. PATENT OFFICE. Official Gazette. Mar. 28, Apr. 4, 11, 18, 1876.

WATERS, J. LINTON. Service and Hymn Books. Miscellaneous pamphlets, 13.

WHIPPLE, GEO. M. Biographical and Genealogical Sketches of Wm. Blackstone. 8vo pamph. To-Day. 1 vol., 8vo.

WILDER, MARSHALL P., Boston. American Pomological Session, 1875. 4to.

WORTHEN, A. H., of Springfield, Ill. Geological Survey of Illinois, Vol. VI.

By Exchange.

AMERICAN ANTIQUARIAN SOCIETY, WORCESTER. Proceedings of. Oct. 21, 1875. **BERLIN, VEREINES ZUR BEFORDERUNG DES GARTENBAUES.** Monatschrift-Jahrg. xviii, 1875.

BOSTON SOCIETY OF NATURAL HISTORY. Proceedings of. Vol. xviii, pt. 11. June-Jan., 1875-76, and Sigs. 13, 14, Feb., 1876. Memoirs, Vol. ii, pt. iv, Apr., 1876.

BOWDOIN COLLEGE. Catalogue of, 1875-76.

CANADIAN INSTITUTE. Journal. Apr., 1876.

CHERBOUGH, SOCIÉTÉ NATIONALE DES SCIENCES NATURELLES DE. Memoires, Tome xviii. 1874. 1 vol., 8vo.

DRESDEN, NATURWISSENSCHAFTLICHEN GESELLSCHAFT "ISIS" IN. Sitzungs-Berichte. Jahrg., 1875.

DUBLIN, ROYAL IRISH ACADEMY. Transactions of. Vol. xxiv, pts. ix, xvi, xvii, 1870. Vol. xxv. 1872-75. Proceedings of. Vol. I, Ser. II. 1871-73. Nos. 5-10. Vol. II, Series II. 1875. Nos. 1-3.

FRANKFURT A. M. SENCKENBERGISCHE NATURFORSCHENDE GESELLSCHAFT. Bericht. 1873-74. 8vo pamph. Abhandlungen, Band ix, Hef. iii, iv. 1874-75.

The annual reports of the Secretary, Treasurer, Curators and Standing Committees were read and accepted, and from them the accompanying

RETROSPECT OF THE YEAR

has been compiled, presenting the work of the Institute, in its various departments, since the last annual meeting.

MEMBERS.—Changes occur in the list of our associates

by the addition of new names and the withdrawal of some by resignation, removal from the county or vicinity, and by death. Fifty-six resident members have been elected. The present number is five hundred and fifteen. Fourteen members have died, all having passed the meridian of life, and eight the allotted period of three score years and ten. Some of them had been connected with the Institute from its organization.

Samuel Gardner Drake, born at Pittsfield, N. H., Oct. 11, 1798; died in Boston, June 14, 1875. Son of Simon and Love Muchamore (Tucke) Drake. At the age of eighteen he went as a clerk to his uncle's store in Boston. Taught school several years in Loudon, N. H., and in New Jersey. In 1828 began business as a bookseller, and except about a year and a half spent in Europe, was identified with that business in Boston until his decease. In July, 1830, he established the first antiquarian bookstore in Cornhill, Boston. This store soon became the resort of the literary men of that day, Bancroft, Hildreth, Prescott, Sparks, Everett, and others well known, and became a kind of literary exchange. In 1845 five gentlemen, one of whom was Mr. Drake, originated the New England Historic-Genealogical Society, whose building is now on Somerset street, Boston. He originated the New England Historical and Genealogical Register, the first number of which was issued in January, 1847. For the first fourteen years, 1847 to 1861, he was the publisher, and a large part of the time, editor of the Register. His best known works are "Book of the Indians," "History and Antiquities of Boston," "Founders of New England," etc. He possessed a large library of 15,000 volumes and 30,000 pamphlets directly or collaterally relevant to American History. He had been President of N. E. Hist. Gen. Society and of the Prince Society, and was

also connected with many other historical societies. He was elected a member Feb. 14, 1849.

Charles Wentworth Upham, son of Judge Joshua Upham, a royalist in the Revolution, born at St. John, N. B., May 4, 1802, graduated at Harvard College in 1821, ordained at Salem Dec. 8, 1824. Colleague with Rev. Dr. John Prince of the First Church. Relinquished the ministry Dec. 8, 1844. At different times editor of *Christian Review* and *Christian Register*. Mayor of Salem in 1852. A member in Massachusetts House of Representatives, of which he was speaker, also of the Massachusetts Senate, and its president in 1857 and 1858. Representative in U. S. Congress in 1853-56, and of the Massachusetts Convention in 1853. In 1828 he published "Letters on the Logos," "Lectures on Witchcraft" in 1831, "Life of Sir H. Vane" in 1835, "Life of J. C. Fremont" in 1856, "Salem Witchcraft," in 1867. He was a frequent contributor to leading reviews and magazines and author of several orations, pamphlets, etc. He was always interested in the various institutions of Salem promotive of education and culture. He contributed several papers to the Historical Collections of the Institute, among which may be mentioned *Memoirs of George A. Ward*, *Francis Peabody* and *Daniel P. King*. His last great work was the completion of the "Life of Col. T. Pickering" (which was commenced by Octavius Pickering, who prepared and caused to be printed the first volume), in 4 vols., 8vo., a valuable contribution to history and a just tribute to the memory of a patriot of the Revolution, who was a friend and counsellor of Washington, both on the field and in the cabinet. Mr. Upham died in Salem on Tuesday morning, June 15, 1875. His wife, Ann Susan, daughter of the late Rev. Dr. Abiel Holmes of Cambridge, and two sons, William Phineas and Oliver Wen-

dell Holmes, survive. He was elected a member of Essex Historical Society March 1, 1825.

Winslow Lewis, of Boston, widely known in many different walks of life, died on Tuesday night, August 3, 1875, at the house of his son, Dr. George H. Gay in Grantville. He was son of Winslow and Elizabeth (Greenough) Lewis and was born in Boston, July 8, 1799. Graduated at Harvard in 1819, studied medicine with Dr. John C. Warren and took his degree in 1822, afterwards pursued his studies with the celebrated Abernethy of London and Dupuytren of Paris. On his return he commenced practice in Boston, and soon rose to distinction. He was consulting surgeon in the Massachusetts General Hospital, and during a successful, extensive and varied practice of thirty-five years educated hundreds of young men, many of whom are now eminent in their profession. He was a scholar, and had an interest in books and the best literature. He translated from the French "Gall on the Brain," in 6 vols., edited an edition of Paxton's Anatomy, and gave many addresses before literary and scientific societies. He had been President of New England Historic-Genealogical Society and of the Boston Numismatic Society. Aside from the profession, his great interest was in Free Masonry. He filled every post of service and honor that the order could bestow. He married, Feb. 22, 1828, Emeline Richards, daughter of Capt. Benjamin Richards, of New London, Conn. He was elected a member Feb. 6, 1865.

John K. Wiggin, well known as a collector of antiquarian and historical books, and as a publisher, was born in Wakefield, N. H., August 5, 1825, and died in Boston, August 20, 1875. He was elected a member Oct. 26, 1859.

Increase Allen Lapham died suddenly at Milwaukee,

Wisconsin, Sept. 14, 1875. He was born at Palmyra, N. Y., March 7, 1811. At one time a civil engineer employed on the Welland Canal and also on the canal around the Falls of the Ohio at Louisville, Ky.; from 1833-1835 Secretary of the Board of Canal Commissioners of Ohio. In 1838 he removed to Milwaukee, where he resided until his decease. In 1862 he was chosen President of the Wisconsin Historical Society. In 1873 he was appointed State Geologist and began making a thorough geological and topographical survey of the State. He was a prolific writer, having been a frequent contributor to scientific journals and other publications. He was elected a member of Essex County Natural History Society, July 13, 1836.

William Prescott, son of William and Deborah (Welch) Prescott, born at Sandbornton, N. H., Dec. 29, 1789. In early life, a farmer. In 1815 received the Medical degree from Dartmouth Medical School, and commenced the practice of the profession at Gilmanton, N. H., where he remained eighteen years. In December, 1832, he removed to Lynn, Mass., and in September, 1845, to Concord, N. H. In 1852 he relinquished active professional labor for the purpose of devoting himself to those literary, scientific, genealogical and antiquarian studies for which he had a decided taste. He died at his home in Concord, Oct. 18, 1875. During his residence in Lynn, he was present and took an active part at the first meeting of the Essex County Natural History Society, Dec. 14, 1833, and was one of the persons named in the Act of Incorporation. For ten years he was one of the curators of the Society, and at the time of his removal from the State one of its Vice Presidents. He delivered a lecture before the Natural History Society in 1838, which was printed in the Journal, on the Minerals of the South-

ern Part of Essex County. His great work, to which he gave many years of labor, is "A Memoir of the Prescott Family," in 1 vol., 8vo.

William Ives, eldest son of Capt. William and Mary (Bradshaw) Ives, was born in Salem, Feb. 15, 1794. He served an apprenticeship in the office of the "Salem Gazette" with the late Thomas C. Cushing. In January, 1823, he commenced the "Salem Observer," which assumed a permanent condition under his management. He was also for many years well known as the senior partner of the old firm of W. & S. B. Ives. He retired several years since and has passed the interval in the enjoyment of social life and in reading. He died at his residence in Salem, Dec. 12, 1875. An original member of Essex County Natural History Society, 1833.

John Merrill Bradbury died at his residence in Ipswich on Tuesday, March 21, 1876. He was the son of the late Ebenezer Bradbury of Newburyport, formerly State Treasurer, and was born in that city Oct. 29, 1818. He was three years a student in Dickenson College, but did not graduate; teacher for several years in Newburyport, then chief clerk in the Treasury Department of the State, and afterwards connected with a banking firm in Boston; retired from business in 1866 with a competency. In 1868 went to Europe and remained there several years. Mr. Bradbury had a fondness for antiquarian research, and devoted his leisure and time to the history and genealogy of many old families of Essex County. He was elected a member Dec. 16, 1873.

Josiah Stickney. This well known and for many years active merchant in the metropolis, died at his residence, on the banks of Charles River, Watertown, Monday, March 27, 1876. He was the son of William and Abigail (Walker) Stickney, and was born at Grafton, Vt., Jan.

6, 1789. He removed to Boston at an early age, and commenced business near the old "Bite Tavern," and was very successful. He was afterwards interested in sugar refinery, railroads, and other business operations, and for many years Director of the Western, Concord, and Connecticut & Passumpsic River Railroads; also Director and President of Market Bank. Mr. Stickney was also prominent as an horticulturist, and long an efficient and interested officer of the Massachusetts Horticultural Society. A contributor to the exhibitions, his grounds in Watertown being always kept in a high state of cultivation, and furnishing the choicest specimens of fruits and flowers. He was elected a member Sept. 4, 1865.

Ebenezer Putnam, son of Ebenezer and Sarah (Fiske) Putnam, was born in Salem, Sept. 6, 1797, graduated at Harvard in the class of 1815, died at Salem, Apr. 3, 1876. In early life he was a teacher in the family of Nathan Read in Maine and also in a family in Virginia. He afterwards spent some years in mercantile life at the west. Postmaster of Salem from 1829 to 1840. He was interested in political history and in the study of the laws which govern states and nations. He also devoted much attention to horticulture and in some departments was a large and successful grower. Associated with his brothers he largely contributed to the Horticultural Exhibitions under the auspices of the Institute. He was elected a member of the Essex Historical Society May 12, 1837.

William E. Doggett, of Chicago, died at Palatka, Florida, April 3, 1876, where he had gone on account of failing health. He was born at Freetown, Mass., Nov. 20, 1820. He went to Chicago in 1846, and established the boot and shoe house of Ward, Doggett & Co. This connection was maintained until the decease of Mr. Ward in 1856. The present firm of Doggett, Bassett & Hills

has continued from that to the present time. In addition to this connection he was largely identified with the trade, commerce, benevolent institutions and progress of Chicago. As Vice President of the Merchant's Savings, Loan & Trust Company, and an officer of the Academy of Science, Chicago Historical Society, Young Men's Library Association, Athenæum, etc., he contributed very materially to the success of these Institutions. In 1858 he married Miss Kate Newell, a lady well known as a writer and lecturer, who survives him. Some ten or twelve years since, during his summer residence for several seasons at Swampscott, he associated himself with the Institute, attended the field meetings and took a lively interest in the promotion of its objects. He was elected a member July 17, 1865.

MEETINGS.—During the summer three *Field Meetings* have been held. The first at the Chebacco House, in Hamilton, June 3, 1875. The woods and ponds in the vicinity are very enjoyable for excursions and meetings of this character. Communications were made by F. W. Putnam, on Shell Heaps and Indian Relics at West Newbury; A. Osgood, Notice of the Mining Lands at Newbury; J. H. Stevens, on the Cane Brakes in Louisiana; L. H. Upton, List of Plants found in Flower. *Second*, at Byfield, July 1, 1875, the seat of Dummer Academy and abounding in interesting historical associations. W. D. Northend spoke of Byfield and the Academy; and J. Spofford, F. W. Putnam, John Robinson, Haydn Brown, Amos Noyes, and S. J. Spaulding offered remarks. *Third*, July 27, 1875, at Concord, Mass. The interest in this historic old town inspired by the events of the 19th of April, 1775, was freshly awakened by the commemoration of the present year. Remarks by E. R.

Hoar, E. S. Morse, F. W. Putnam, E. C. Bolles, G. Reynolds, and others.

Regular Meetings. Twenty-one have been held at the rooms, usually on the first and third Monday evenings of each month. The papers read and lectures delivered have proved exceedingly instructive. The following may be specified:—W. P. Upham, on the Settlement of Rev. S. Skelton, and on the Siege of Boston; James Kimball, on Indian Utensils; A. Graham Bell, on Visible Speech; G. F. Wright, on Indian Ridge and its Continuation in Andover; S. C. Oliver, on the Instinct and Intelligence of Animals; George M. White, on Pottery; John Robinson, Addenda to the Ferns of Essex County; E. S. Atwood, on the Manufacture of Silver Plated Ware; S. G. W. Benjamin, on the Theory and Practice of Art; N. H. Chamberlain, on the Way of making Orators; C. H. Higbee, on Algæ; F. W. Putnam, on the Ancient Race of Peru.

LECTURES AND CONCERTS.—A course of four very able and instructive lectures on the Relation of the Mind to the Nervous System were given by Dr. Amos H. Johnson of this city. The lectures were attended by a large and appreciative audience. The receipts of the entire course were generously given to the Institute by the lecturer.

Under the direction of the Curator of music, four concerts were given, which proved highly successful. 1st. On Monday evening, Nov. 22, by Mr. B. J. Lang and Miss Ita Welsh; 2nd. On Monday evening, Dec. 13, by Mrs. J. W. Weston, Messrs. G. W. Sumner and George Bridgham; 3d. On Wednesday evening, Dec. 29, by Messrs. August and Wulf Fries and Arthur W. Foote; 4th. Monday evening, January 10, by Mrs. Edward

Kemble, Mrs. George Upton, Dr. S. W. Langmaid and Mr. Arthur W. Foote.

ART EXHIBITION.—Opened at the rooms of the Institute on Tuesday, Nov. 9, and closed Wednesday the 17th, under the skilful and tasteful direction of the Curator of painting and sculpture. It was the generally expressed opinion that this was one of the most pleasing and interesting exhibitions ever given by the Institute. It was largely attended and the display of pictures was exceedingly creditable to the taste of our citizens, who cheerfully loaned their works of art, many of which were extremely valuable. The main hall was devoted to the display of oil paintings, water colors, pen and ink, and pencil sketches. The eastern anteroom was occupied by the display of bronzes, porcelain and pottery. This was the first ceramic exhibition in Salem.

LIBRARY.—The additions by donations and exchange during the year were as follows :—

<i>Donations.</i>			
Folios,	2	Pamphlets and Serials, . . .	3,065
Quartos,	17	Total of bound volumes, . . .	545
Octavos,	413		
Duodecimos,	37	Total of Donations,	3,610
Sexdecimos,	17		
Total,	545		
<i>Exchanges.</i>			
Quartos,	6	Pamphlets and Serials, . . .	1,191
Octavos,	815	Total of bound volumes, . . .	384
Duodecimos,	43		
		Total of Exchanges,	1,555
Total,	864	Total of Donations,	3,610
			5,165
<i>By Purchase,</i>			
Quartos,	41		43
Duodecimos,	2	Total of Additions,	5,208
			43

Of the total number of pamphlets and serials, 1,824 were pamphlets, and 2,432 were serials.

The donations to the Library for the year have been received from one hundred individuals and twelve societies and departments of the General and State Governments. The exchanges from ninety-three societies and incorporate institutions, of which sixty-one are foreign; also from editors and publishers.

The library has been carefully examined and all the books have been put in good order. The number of exchanges has increased during the year. Large additions have been made to the valuable and full collection of directories and also to the public documents.

The Assistant Librarian has commenced the preparation of a catalogue of the books in the upper hall, alphabetically by authors. This in its first rough form is now completed, except only the letter W. This will furnish a basis for a finished catalogue hereafter. The Secretary has arranged, catalogued, and placed in convenient folios for easy reference, the large number of maps, plans, engravings and prints of a miscellaneous character. The musical library has been rearranged, and the large collection of programmes, play bills, and musical catalogues have been placed in folios.

The collection of manuscripts has been placed in glass cases in the eastern portion of the gallery of the western anteroom, and are partially put in order. It is intended to have an index which shall render access to them more convenient.

MUSEUM.—Many valuable specimens in natural history have been given during the year, and are on deposit with the Trustees of the Peabody Academy of Science, in ac-

cordance with previous arrangements. These have been reported at our meetings, and have been duly acknowledged to the several donors. In addition to these several interesting specimens of an historical character have been arranged in the rooms of the Institute, and contribute very much of interest and value to the antiquarian and historical portion of the museum. To the Technological department several series of specimens have been added.

PUBLICATIONS.—The BULLETIN has been continued, and gives full reports of the doings of the Institute, and abstracts of papers read at the meetings. The HISTORICAL COLLECTIONS, Vol. xiii, No. 2, has been printed.

BY-LAWS.—The revised By-laws, adopted in March, will soon be printed for circulation among the members.

EXCURSIONS.—Two excursions arranged by members and friends of the Institute, one by boat to the Isle of Shoals, the other by rail to the White Mountains, were largely attended. They were planned to promote the social objects of the Institute and were quite satisfactory in the results.

CENTENNIAL EXHIBITION.—The Directors of the Institute, in compliance with several official circulars and personal letters from the Chief of the Historical Department of the Centennial Exhibition at Philadelphia, voted to make an exhibit of specimens illustrative of the history of Salem. Six portraits of persons noted in the early history, and about one hundred articles of historical interest, also an album containing one hundred and twenty

photographs illustrating our city, have been carefully packed for sending to Philadelphia under the personal care of an officer of the Institute.

FINANCIAL.—The Treasurer's Report shows the following receipts and expenditures during the year.

DEBITS.*General Account.*

Athenæum, Rent, etc., \$350.00; Salaries, \$782.00; Coal, \$160.00, . . .	\$1,292.00
Express and Postage, \$64.67; Insurance, \$40.00, . . .	104.67
Binding, \$20.00; Gas, \$161.53; Publications, \$850.93, . . .	1,132.46
Sundries, \$86.77; Expenses of Excursions, \$2,077.96 . . .	2,164.63
Department of Art, 1874, 1875, \$238.24; Stationery, 19.23, . . .	257.47
Balance of last year's account, . . .	89.58
Balance in hands of Treasurer, . . .	65.85

Historical.

Books,	158.00
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Natural History and Horticulture.

Books, \$3.93; Sundries, \$12.50,	16.43
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Ditmores Fund.

Chicago City Bond with accrued interest,	1,068.22
	<u>\$6,339.31</u>

CREDITS.*General Account.*

Dividends Webster Bank,	15.00
Assessments, \$1,341.00; Publications, \$90.21,	1,331.21
Sundries, \$201.43; Excursions, \$2,316.10,	2,517.53
Salem Athenæum, one-half coal and janitor,	173.33
Lectures, \$165.05; Art Department, \$5.80,	170.85
Due to late Treasurer and included in a note passed to him Dec. 11, 1875,	615.49

Historical.

Dividends Naumkeag Bank,	18.00
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Natural History and Horticulture.

Dividends P. S. & P. R. R.,	16.00
Dividends Lowell Bleachery,	23.00

Davis Fund.

Coupons Burlington and Missouri R. R.,	240.00
Coupons Dixon, Peoria and Hannibal R. R.,	140.00

Ditmores Fund.

Received from Executor,	1,000.00
Coupons Chicago City Bond,	70.00
	<u>\$6,339.31</u>

The following Officers were then elected, until others shall be chosen in their stead :—

PRESIDENT:
HENRY WHEATLAND.

Vice-Presidents :

ABNER C. GOODELL, Jr.	WILLIAM SUTTON.
FREDERICK W. PUTNAM.	DANIEL B. HAGAR.

<i>Secretary :</i>	<i>Treasurer :</i>
GEORGE M. WHIPPLE.	DAVID PINGREE.

<i>Auditor :</i>	<i>Librarian :</i>
RICHARD C. MANNING.	WILLIAM P. UPHAM.

CURATORS:

<i>History</i> —JAMES KIMBALL.	<i>Botany</i> —JOHN ROBINSON.
<i>Manuscripts</i> —W. P. UPHAM.	<i>Zoology</i> —EDWARD S. MORSE.
<i>Archæology</i> —F. W. PUTNAM.	<i>Horticulture</i> —CALEB COOKE.
<i>Numismatics</i> —M. A. STICKNEY.	<i>Painting & Sculpture</i> —T. F. HUNT.
<i>Geology</i> —ALPHEUS S. PACKARD, Jr.	<i>Technology</i> —EDWIN C. BOLLES.

COMMITTEES:

<i>Finance :</i>		
JOHN C. LEE.	JAMES UPTON.	JAMES O. SAFFORD. H. M. BROOKS.
<i>Library :</i>		
CHAS. W. PALFRAT.	JOSEPH G. WATERS.	HENRY F. KING.
GEORGE F. FLINT.		WM. NEILSON.
<i>Publications :</i>		
ABNER C. GOODELL, Jr.	EDWARD S. ATWOOD.	
EDWIN C. BOLLES.		JAMES KIMBALL.
<i>Lectures :</i>		
WILLIAM D. NORTHEND.	A. H. JOHNSON.	F. W. PUTNAM. A. L. HUNTINGTON.
<i>Field Meetings :</i>		
ALLEN W. DODGE, Hamilton.	FRANCIS H. APPLETON, Peabody.	
GEO. COGSWELL, Bradford.	LEWIS N. TAPPAN, Manchester.	
GEORGE D. PHIPPEN, Salem.	FRANCIS H. JOHNSON, Andover.	
GEORGE PERKINS, Salem.	R. S. SPOFFORD, Newburyport.	
E. N. WALTON, Salem.	N. A. HORTON, Salem.	

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 8. SALEM, MASS., JUNE, JULY, 1876. No. 6.

One Dollar a Year in Advance. Ten Cents a Single Copy.

REGULAR MEETING, MONDAY, JUNE 5, 1876.

MEETING this evening. Vice President F. W. PUTNAM in the chair. Mr. T. F. HUNT was elected Secretary, *pro tem*. Records of the preceding meeting were read.

Mr. Putnam exhibited and made remarks on a number of ancient gold images recently secured by the Peabody Museum of Archæology in Cambridge. The articles were principally from graves near Bogota, New Grenada, and were particularly interesting in connection with the mythology of the ancient race by whom they were made.

J. F. Lougee of Salem was elected a resident member.

REGULAR MEETING, MONDAY, JUNE 19, 1876.

MEETING this evening. The PRESIDENT in the chair. Mr. F. W. PUTNAM was requested to act in the absence of the Secretary. Records of the preceding meeting were read.

The presentation of an interesting collection, from Alfred Peabody of Salem, suggested remarks from several members and occupied the hour of the meeting. This collection consisted of specimens, in fine condition, of skins of seven species of birds from Madagascar. Also the horns of a gemsbok from Madagascar, and several botanical specimens from the Cape of Good Hope.



REGULAR MEETING, MONDAY, JULY 3, 1876.

MEETING this evening. The PRESIDENT in the chair. Records of the preceding meeting were read.

Messrs. Charles Henry Hart, Frank M. Etting and Samuel Chew, of Philadelphia, were elected corresponding members.

Helen J. Almy of Salem was elected a resident member.



FIELD MEETING AT BEACHMONT, SATURDAY, JULY 22, 1876.

THE first field meeting of the season was held this day at Beachmont on the line of the Boston, Revere Beach & Lynn Railroad. The party left Salem at 9.20 A. M., and Lynn at 10.00, and proceeded to the Ocean House on the eastern end of the Revere Beach, where two hours were pleasantly spent in rambling over the fine beach and enjoying the refreshing sea breeze. At noon the cars were taken for Beachmont, the place of rendezvous, near the western end of the beach. This remarkable elevation rises directly above the southern shore of Lynn Bay. On its eastern extremity the rollers break as they come in from the open sea. The view from the summit is

varied and beautiful. Boston, Charlestown, Chelsea, Malden, Saugus, Lynn, Swampscott and Nahant in all their diversified beauties, while the blue expanse of the ocean with its numerous sail and the occasional passing steamer, form a grand panorama that is seldom equalled. Nestling near the southern base is the little town of Winthrop, with its rural and pastoral appearance in striking contrast to its surroundings, which are essentially marine. This locality is well adapted for seaside residences, and it is to this hill that Dr. Petermann alluded in his recent address before the American Geographical Society, as furnishing the most delightful view he had seen in America. At the summit a building has been erected, which was the headquarters for the day, where the lunch was partaken and the afternoon session was held.

At 2.30, P. M., the meeting was called to order by the PRESIDENT. Mr. F. W. PUTNAM was requested to act as Secretary in the absence of that officer. Records read.

The SECRETARY announced the following correspondence :—

From E. P. Alnsworth, June 3; H. J. Almy, July 12; F. H. Appleton, Lynnfield, May 25, July 10; E. P. Boon, New York, May 30, June 13; Henry Breed, Lynn, July 14; S. Chew, Germantown, Penn., July 11; D. P. Corey, Boston, June 27; Frank M. Etting, Philadelphia, May 15, 24; D. B. Hagar, May 25; Charles Henry Hart, Philadelphia, July 10; Samuel Henshaw, Boston, June 20; A. L. Huntington, June 5; O. A. Jenison, Lansing, Mich., June 30; F. H. Johnson, Andover, May 30; S. Kimball, Marblehead, July 19; I. P. Langworthy, Boston, June 20; Jacob Leamon, Condit, Ohio, May 15; G. B. Loring, July 14; Samuel W. McDaniel, Cambridge, May 15; George H. McLean, Washington, Del., July 19; A. S. Packard, Jr., July 20; E. H. Payson, June 9; David Pingree, May 22; C. P. Preston, Danvers, June 26; P. D. Richards, Philadelphia, May 29, July 20; Hor. Binney Sargent, June 1; C. O. Thompson, Worcester, May 17; G. M. Whipple, Philadelphia, May 19; G. F. Wright, Andover, June 20; American Social Science Association, Boston, May 31; Augsburg, Naturhistorischen Verein in, Feb. 1; Bamberg, Naturforschende Gesellschaft; Basel, Naturforschende Gesellschaft, Feb. 22; Berlin, Die Gesellschaft Naturforschender Verein, May 22; Boston Society of Natural History, July 14; Brunn, Naturforschende Verein, Feb. 14; Buffalo Historical Society, May 22, June 20, July 1; Calcutta, Geological Survey of India, Dec. 1; Chemnitz, Naturwissenschaftliche Gesellschaft, Apr. 1; Danzig, Naturforschende Gesellschaft, Apr.

15; Edinburgh, Royal Society, Feb. 31; Erlangen, Physikalisch-medicinische Societat, Apr. 8; Freiburg, Naturforschende Gesellschaft, Mar. 17; Genève, Société de Physique et de Histoire Naturelle, Jan. 25; Lowell Bleachery, July 7; Marburg, Gesellschaft zur Beförderung der Gesammten Naturwissenschaften, April; New England News Co., July 28; New Jersey Historical Society, June 19, 30; New York, Academy of Sciences, June 19; New York Historical Society, June 19, 30; Ohio Historical and Philosophical Society, May 22, June 19, July 1; Pennsylvania Historical Society, June 17; Philadelphia Academy of Natural Sciences, June 28; Rhode Island Historical Society, July 19; Salem Hospital, June 29; U. S. Office of Med. Statistics, May 25; Vermont Historical Society, May 22, July 12; Waterbury, Brounson Library, June 1; Wien, K. Akademie der Wissenschaften, Dec. 27; Wien, K. K. Zoologische-botanische Gesellschaft, March; Worcester Lyceum and Natural History Association, May 24; Yale College, July 15.

The LIBRARIAN reported the following additions:—

By Donation.

- APPALACHIAN MOUNTAIN CLUB. Appalachia. June, 1876. 8vo.
 BOLLES, E. C. Homage to the Book. 1 vol., 12mo. The Pilgrim Series Question Book. 3 vols., 12mo. National Series of Sunday School Lessons. 2 vols., 12mo. Miscellaneous pamphlets, 23.
 CARPENTERS' COMPANY, PHILADELPHIA. By-Laws, Regulations and Rules, etc. 1 vol., 8vo. Phila., 1873.
 FOSTER, W. H. Miscellaneous pamphlets, 18.
 GOODELL, JR., A. C. Miscellaneous pamphlets, 139.
 GREEN, S. A., of Boston. Miscellaneous pamphlets, 25.
 HUMPHREYS, A. A., of Washington, D. C. U. S. Geological Surveys. Vol. 3, 1876. 1 vol., 4to.
 HUNT, T. F. History of Independence Hall, by F. M. Etting. 1 vol., 8vo. 1876. Celebration of the Centennial Anniversary of the Evacuation of Boston by the British Army, March 17, 1776, by Geo. E. Ellis. 1 vol., 8vo.
 JOHNSON, THOMAS H. Salem Post for 1873, 1874, 1875.
 KIMBALL, JAMES. Cape Ann Advertiser, Mar., Apr., May, 1876.
 KINGSLEY, J. S. Hand-Book of the Kansas State Agricultural College. 8vo pamph. 1874.
 MACK, ESTHER C. Dwight's Journal of Music, 1692-1672. 6 vols., 4to.
 MACK, WM. Miscellaneous volumes, 31. Miscellaneous pamphlets, 60.
 NEWHALL, THOMAS A., Germantown, Penn. List of Emigrants to America, 1600-1700. 1 vol., small 4to. Memoirs of the Historical Society of Penn., Vol. viii. 1 vol., 8vo. History of Essex Co., by Phillip Morant. 2 vols., folio. London, 1768. Reprint, 1816.
 NOURSE, DORCAS C. Oliver Optics for 1870, 1871, 1872, 1873, 1874.
 OSGOOD, CHAS. S. Eastern Railroad Investigation, 1876. 1 vol., 8vo. Boston and Albany Railroad Investigation, 1876. 1 vol., 8vo. Briggs' Investigation, 1876. 1 vol., 8vo.
 PALFRAT, C. W. Miscellaneous pamphlets, 8.
 PRABODY, ALFRED. History of the Pacific Guano Company. 8vo pamph.
 PERKINS, ALBERT C., of Exeter. N. H. Catalogue of Officers and Students of Phillips Exeter Academy, 1875-76. 12mo.
 PUTNAM, F. W. New York Tribune, Apr., May, 1876.
 STORY, AUGUSTUS. Kastner's Archiv für die gesammte Naturlehre. 19 vols., 8vo. Archiv für Chemie und Meteorologie. 9 vols., 8vo. 18 other volumes. Also Miscellaneous pamphlets, 26.
 TUCKER, JONATHAN. Miscellaneous pamphlets, 6.

U. S. PATENT OFFICE. Official Gazette, Mar. 28, Apr. 4, 11, 18, May 2, 30, June 6, 27.

WATSON, CAROLINE A. Holy Bible. 1 vol. London, 1599.

By Exchange.

AMERICAN ACADEMY OF ARTS AND SCIENCES, BOSTON. Proceedings. 1875-76. 8vo.

AMERICAN PHILOSOPHICAL SOCIETY. Proceedings. Vol. xvi. Jan.-June, 1876
BALTIMORE, MD., PEABODY INSTITUTE. Report of the Provost to the Trustees, June 4, 1868, June 1, 1876. 2 pamphlets, 8vo.

BERLIN, GESELLSCHAFT NATURFORSCHENDER FREUNDE ZU. Sitzungs-Berichte Jahrg. 1875.

BOSTON SOCIETY OF NATURAL HISTORY. Proceedings. Apr., May, 1876.

CALCUTTA, GEOLOGICAL SURVEY OF INDIA. Memoirs, Ser. ix, pt. 2, 3, 1875. Records, Vol. viii, pt. 1, 2, 3, 4, 1875.

CANADIAN INSTITUTE. Journal. July, 1876.

CONNECTICUT ACADEMY OF ARTS AND SCIENCES. Transactions of the. Vol. 3, pt. 1. 8vo.

ERLANGEN, PHYSIKALISCH-MEDICINISCHE SOCIETAT IN. Sitzungs-berichte, Haft vii. Nov., 1874, Aug., 1875. 8vo.

GENÈVE, SOCIÉTÉ DE PHYSIQUE ET D'HISTOIRE NATURELLE. Memoires, vol. xxiv, pt. 1, 1874-5.

GEORGIA HISTORICAL SOCIETY, Savannah, Ga. Address, Jan. 3rd, 1876, on Sergeant Wm. Jasper, by Charles C. Jones, Jr. 8vo. Proceedings of the Dedication of Hodgson Hall, Feb. 14, 1876. 8vo.

GÖTTINGEN, KÖNIGLICHE GESELLSCHAFT DER WISSENSCHAFTEN. Nachrichten Jahrg. 1875. 12mo.

HAMBURG, VEREINS FÜR NATURWISSENSCHAFTLICHE UNTERHALTUNG ZU. Verhandlungen, Bd. 11. 1875.

HARVARD UNIVERSITY, MUSEUM OF COMPARATIVE ZOOLOGY. Bulletin, Vol. iii. Nos. 11-14. 1876.

HARVARD UNIVERSITY, PEABODY MUSEUM OF AMERICAN ARCHEOLOGY AND ETHNOLOGY. Ninth Annual Report of the Trustees of. Apr., 1875. 8vo.

KJØBENHAVN, BOTANISK TIDSSKRIFT. Tidsskrift, II Række. Band IV. 1874.

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NATURAL HISTORY SOCIETY OF MONTREAL. Canadian Naturalist. Vol. vii, Nos. vii, viii. Vol. viii, No. i. 1875.

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- NEW ENGLAND HISTORIC-GENEALOGICAL SOCIETY. Register. Vol. xxx, Apr., July, 1876.
- NEW YORK CHAMBER OF COMMERCE. Eighteenth Annual Report of the Corporation, 1875-76. 1 vol.
- NEW YORK GENEALOGICAL AND BIOGRAPHICAL SOCIETY. Record. Vol. vii, Apr., July, 1876.
- NEW JERSEY HISTORICAL SOCIETY. Proceedings. Vol. 4. 2nd Ser., No. 3, 1876.
- PARIS, ARCHIV DER ANTHROPOLOGIE. Band viii. Jan., 1876.
- PARIS, CROSSE ET FISCHER. Journal de Conchyliologie. Tome xv. Oct., 1875. Tome xvi, No. 1. Jan., 1876.
- PARIS, INSTITUT HISTORIQUE. L'Investigateur. Sept., Oct., Nov., Dec., 1875. Jan., Feb., 1876.
- PARIS, SOCIÉTÉ D'ACCLIMATATION. Bulletin Mensuel. Tome ii, 3e Serie. Oct., Nov., Dec., 1875. Tome iii, 3e Serie. No. 1, 2, 1876.
- PARIS, SOCIÉTÉ D'ANTHROPOLOGIE. Bulletins. Tome ix, 11e Serie. Nov., Dec., 1874. Tome x, 11e Serie. Juillet-Dec., 1875.
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- REGENSBURG, KÖNIGLICHE BAYERISCHE-BOTANISCHE GESELLSCHAFT. Flora. 1875. 1 vol., 8vo.
- SAMPSON AND DAVENPORT, Boston. Ninety-six Directories of various cities.
- SMITHSONIAN INSTITUTION. Bulletin of the U. S. National Museum. Nos. 5, 6, 1876.
- SOCIÉTÉ GEOLOGIQUE DE BELGIQUE. Annales, Tome 1, 1874.
- ST. LOUIS ACADEMY OF SCIENCE. Transactions of the. Vol. 3, No. 3. 1876.
- PUBLISHERS. American Journal of Science and Art. American Naturalist. Beetle and Wedge. Boston Daily Globe. Bradford New Era. European Mail. Gardener's Monthly. Gloucester Telegraph. Hardwicke's Science-Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn City Item. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Sailors' Magazine and Seamen's Friend. Salem Gazette. Salem Post. Salem Register. Salem Observer. Turner's Public Spirit.

The PRESIDENT remarked that the first field day usually occurs in the early part of June. In this, the centennial year, so replete with many interesting and all absorbing exhibitions and commemorations, the accustomed routine has been interrupted.

He alluded to several rare species of mollusks and other marine animals that are occasionally found on the Revere Beach during the lull, or after the close, of an easterly storm.

The President called on Prof. E. S. MORSE, who gave an interesting and very instructive general statement in regard to the formation of hills, and of the existing glaciers on the coast of Alaska. He showed how ridges,

like the hill on which the party were holding the meeting, were made by the masses of ice, or glacier. Another set of hills are produced by volcanic action; still another way of hill making is by the bending of rocks due to the continued concentration and rending of the crust of the earth. This, Prof. Morse said, might be illustrated by chains of mountains, the largest mountains being found on the borders of the largest areas of subsidence. He illustrated these formations with a piece of fruit cake, showing how the cake will bend and finally split, exposing the corresponding strata on each side in the form of mountain chains with a valley between. Prof. Morse mentioned Prof. Niles' experiments on the expansion of rocks, showing that lateral pressure in rocks exists.

Mr. GEO. DIXON of England spoke of the Winston dyke, and its formation, and gave a description of the dyke crossing the German Ocean. Prof. MORSE remarked on the fluid nature of trap, and the erosion caused by ice, as in the Connecticut valley, where the matrix of sandstone has been eroded, leaving the trap standing and protecting the sandstone below.

Mr. F. W. PUTNAM said he had looked for a shell heap said to be on the point, but did not succeed in finding it. He therefore gave a short account of the present Indians of the plains and the existing Indian War, and endorsed the views lately expressed by Mr. L. H. Morgan in regard to the proper policy to be pursued in relation to the Indians.

He then introduced Dr. G. A. OTIS, U. S. A., and Curator of the Army Medical Museum at Washington.

Dr. OTIS gave a brief account of the life of the Indian chief, Sitting Bull, from a pictograph made by that chief and now in the Army Medical Museum. Dr. Otis also

spoke of the advantages enjoyed by members of the Institute, and said he doubted if they were aware of the high reputation which the society had gained in the estimation of educated and scientific men away from its immediate location.

Mr. D. M. BALCH gave an account of the few minerals he had been able to find during the morning's ramble. They consisted principally of the several varieties of porphyry; the specimens were exhibited and elicited some remarks.

Mr. DIXON spoke of the plants he had found in the vicinity, and remarked on a plant which he stated should be emblematic of America, the *Epigea repens*, as he thought there should be a flower as well as a bird. Mr. Dixon also discussed the question of what the shamrock was.

Mr. S. C. BANCROFT asked for further information in regard to the shamrock, whether or not it was the same as the clover. Prof. MORSE, in answer to the question, believed that the word shamrock was known before clover was introduced, but that afterwards clover took the name of shamrock.

Mr. BANCROFT asked if our common plants, weeds for instance, were as common in foreign lands as here. Mr. DIXON answered that many flowers, weeds, etc., come with civilization, as for instance the wood-wax. He further alluded to the trouble we should probably experience from the introduced sparrow.

Mr. PUTNAM mentioned that the ornithologists gave timely warning against the introduction of the sparrow, and in regard to an emblematic plant he thought that while the *Epigea* as a flower would be appropriate, its present want of a popular name would be against its general adoption.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 8. SALEM, MASS., AUGUST, 1876. No. 7.

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FIELD MEETING AT MANCHESTER, THURSDAY, AUGUST 10, 1876.

MEMBERS of the Institute and their friends residing in Salem and the neighboring towns, took the morning train for Manchester. On arriving at the station they were met by several gentlemen, and conducted to the Town Hall, which had been placed at the disposal of the Institute for the day by the courtesies of the town authorities.

After a cordial welcome, which was extended by Mr. Lewis N. Tappan in behalf of the citizens, the party, increased by additional arrivals, separated into groups and visited the several places of interest which had been designated, according as inclination prompted. Some went to Agassiz Rock,¹ a boulder of very large size, situated upon the top of Beaver-dam hill, about three miles from the town hall on the Essex road, and rests upon a small point of another rock so as to allow an open space

¹ See Bulletin of Essex Institute, Vol. VI, page 158.

between it and the underlying ledge. Several years since Prof. Agassiz visited this hill and was much interested in this particular rock; and on the occasion of a field meeting of the Essex Institute in this town during October, 1874, several members visited the boulder and named it "Agassiz Rock," in commemoration of that distinguished naturalist. Some went to Kettle Cove to examine two interesting and remarkable natural curiosities located in its vicinity, just within the limits of Gloucester. One of these, a large fissure in the rocks on the seacoast, through which the ocean thunders and tosses its spray, known as "Rafe's Chasm." The name is said to be derived from a man named Ralph, who resided near by. Its length forms a right angle with the shore, from which it extends more than two hundred feet. The other is "Norman's Woe," a large rock lying a few rods from the shore and connected with it by a reef of stones which the sea leaves bare at low tide. Longfellow, in "The Wreck of the Hesperus," has alluded to this rock and given it a kind of immortality. Eagle Head, and several of the fine beaches, including the "musical sands," which are situated on part of what is known as "Old Neck Beach," or "Musical Beach," and are alluded to in a notice of the meeting on Thursday, August 2, 1866,² were visited. This rocky coast is relieved by several of these beautiful beaches, especially at some of the inlets or coves which indent the coast and add greatly to the attractiveness of this town for summer residents. Everywhere the landscape is most picturesque and varied. The woods, intersected by numerous brooks and rivulets, offer many inducements to the botanist to make explorations, and be sure of a reward for his toil in the obtaining choice speci-

² See Proceedings of Essex Institute, Vol. V, page 57.

mens of ferns that thrive so luxuriantly in many of the cool and sequestered places there found. Also other plants that thrive in this congenial soil and aspect, specimens of which were placed upon the table for examination.

The antiquary, as well as the lover of the picturesque and beautiful in Nature, can find much to interest him in the examination of the old records and in gathering up the traditionary lore that always clusters around our old New England towns. Manchester was settled about 1626, and was formerly a part of Salem, and known as "Jeffrey's Creek," named from William Jeffrey, an early settler and one of those who, with Roger Conant, John Lyford and others, separated from their brethren at Plymouth, about 1624, and joined those of the Dorchester Company who had set up a fishing establishment at Cape Ann, and removed thence to Salem in 1626, and formed the first permanent settlement in the colony of the Massachusetts Bay. Incorporated in 1640 as Manchester. An interesting series of articles on "The History of Manchester," is in course of printing in "The Beetle and Wedge," from the pen of John Lee, Esq., for many years the able and efficient town clerk.

At 1 o'clock the various parties reassembled at the Town Hall, where lunch was partaken, and the afternoon session was held. Many citizens of Manchester and places contiguous were present.

At 2.30 P. M. the meeting was called to order. The PRESIDENT in the chair. Records of the preceding meeting were read.

The SECRETARY announced the following correspondence:—

From Bern, Die Naturforschende Gesellschaft; J. S. Boothby, Philadelphia, Aug.

3; Buffalo Society of Natural Sciences, July 21; Calcutta, Geological Survey of India, Mar. 30; Frank M. Etting, Philadelphia, July 31; Charles Hammond, Monson, Aug.; Henry A. Homes, Albany, July 22; Mannheim, Verein für Naturkunde, April 4; Lewis N. Tappan, Manchester, Aug. 3.

The LIBRARIAN reported the following additions to the library:—

By Donatton.

- ALLEN, STEPHEN M., of Boston. Religion and Science, by donor. 1 vol., 12mo.
 BAXTER, J. H., of Washington, D. C. Medical Statistics of the Provost Marshal General Bureau. Vols. 1, 2. 2 vols., 4to.
 BOLLES, E. C. Miscellaneous pamphlets, 10.
 CLOUTMAN, WM. R. Letters by Wm. Warden. 1 vol., 8vo.
 HUNT, T. F. New York Mirror, 1837-38. 1 vol., 4to. Popular Science Monthly, Aug. Centennial Eagle, July 4, 11, 18.
 JOHNSON, SAMUEL. Kenrick's Exposition. 3 vols., 8vo. Writings by Prof. Frisbee. 1 vol., 8vo. Salem Directories, 1836, 1839, 1874. 3 vols., 8vo. Memoir of Dr. Holly. 1 vol., 8vo. Heavenly Union. 1 vol., 8vo. Greenwood's Miscellanies. 1 vol., 8vo. Sermons of Consolation. 1 vol., 8vo. Revised Statutes of Mass., 1836. 1 vol., 8vo. Greenwood's Sermons. 2 vols., 8vo.
 NORRIS, C. H. Sermon preached at Lexington, Apr. 19, 1776, by Jonas Clark. 8vo pamph.
 PALFRAY, C. W. The American State, by W. G. Dix. 1 vol., 8vo.
 PAYSON, E. H. The California, 1846, '47, '48.
 PERRY, W. S., of Geneva, N. Y. Miscellaneous pamphlets, 7.
 PUTNAM, A. P., of Brooklyn, N. Y. Easter Service of the Church of the Saviour, Apr. 16, 1876. 8vo. Discourse, Jan. 9, 1876. 8vo.
 PUTNAM, F. W. Declaration of Independence and Washington's Farewell Address. 1 vol., 8vo.
 SANBORN, GEO. Mass. Legislative Documents, House. 2 vols., 8vo. Senate 2 vols., 8vo. Order of the Day. 1 vol., 8vo. Miscellaneous pamphlets, 75.
 U. S. BUREAU OF EDUCATION, through Hon. JOHN EATON, Commissioner. Report of the Board of Education of New York, 1874. 1875. Maryland, 1874. Connecticut, 1872. 1873, 1874, 1875. St. Louis, 1899-70, 1871-72. Pennsylvania, 1875. Iowa, 1874-75. Miscellaneous pamphlets, 81.
 U. S. DEPARTMENT OF INTERIOR. Congressional Documents, 3rd Session, 43 Cong. 1 vol., 4to. 1st Sess., 43 Cong. 3 vols., 8vo. 2nd Sess., 43 Cong. 32 vols., 8vo.
 U. S. ENGINEERS' OFFICE, through Gen. A. A. HUMPHREY, Chief of Engineers. Report of Explorations in Utah in 1859, by J. H. Simpson. 1 vol., 4to. Washington, 1875.
 U. S. PATENT OFFICE. Official Gazette. May 30, June 6, 27, July 4, 11, 18, 25, 1876.

By Exchange.

- AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. Proceedings of, Aug., 1875. 1 vol., 8vo.
 BERLIN, ZEITSCHRIFT FÜR DIE GESAMMTEN NATURWISSENSCHAFTEN. Band xii, xli. 1875. 8vo.
 BOLOGNA, RIALE ACCADEMIA DELLE SCIENZE. Rendiconto, 1876-76. 8vo.
 BOSTON PUBLIC LIBRARY. Bulletin for July, 1876.
 BREMEN, NATURWISSENSCHAFT VEREIN ZU. Abhandlungen. Band iv, Heft. iv, 1876. Band v, Heft. i, 1876.

- BRÜNN, NATURFORSCHENDEN VEREINES IN. Verhandlungen. Band xiii. 8vo. Katalog. 8vo.
- CANADA, GEOLOGICAL SURVEY OF. Report of Progress for 1874-75. 8vo.
- CHEMNITZ, NATURWISSENSCHAFTLICHEN GESELLSCHAFT ZU. Bericht. Jan., 1873, Dec., 1874. 8vo. Phanerogamen Flora von Chemnitz und Umgegend. 4to.
- DANZIG, NATURFORSCHENDE GESELLSCHAFT IN. Schriften. Band iii, Heft. iv. 8vo.
- FRANKFURT, ZOOLOGISCHE GESELLSCHAFT IN. Zoologische Garten, Jahrg xvi, Nos. 7-12. 1875.
- FREIBURG, NATURFORSCHENDEN GESELLSCHAFT ZU. Berichte. Band vi, Heft. iv. 8vo.
- LE MANS, D'AGRICULTURE, SCIENCES ET ARTS DE LA SARTHE. Bulletin. Tome xxiii. 1875.
- MARBURG, GESELLSCHAFT ZUR BEFÖRDERUNG DER GESAMMTEN NATURWISSENSCHAFTEN IN. Sitzungs-berichte Jahrg. 1874, 1875. Schriften. 1874. 8vo.
- PARIS, FRANCE, CROSSE ET FISCHER. Journal de Conchyliologie. Tome xvi. 2e Série. No. II. 1876.
- PARIS, SOCIÉTÉ D'ACCLIMATION. Bulletin Mensuel. Tome iii. Nos. 2, 4. 1876. 8vo.
- S' GRAVENHAGE, NEDERLANDSCHE ENTOMOLOGISCHE VEREENIGING. Tijdschrift Voor Entomologie. Achttiende Deel i, ii, iii, iv. Aflevering. 1874-75.
- SOCIÉTÉ ENTOMOLOGIQUE DE BELGIQUE. Annales. Tome xvii. Fasc. i, ii. 1874-75. Tome xviii. Fasc. i, ii, iii. 1875-76. 8vo.
- TASMANIA, ROYAL SOCIETY OF. Notices of Papers and Proceedings of the, for 1874. 12mo.
- VEREINS FÜR ERDKUNDE. Notizblatt/Folge'iii, Heft. xiv.
- WIEN, K. K. ZOOLOGISCH-BOTANISCHE GESELLSCHAFT. Verhandlungen. Band xxv. Jahrg. 1875. 8vo.
- WÜRZBURG, PHYSIKALISCH-MEDICINISCHE GESELLSCHAFT IN. Verhandlungen. Neue Folge ix, Band i, ii, Heft. 8vo.
- PUBLISHERS. American Journal of Science. Beetle and Wedge. Boston Globe. Bradford New Era. Gardener's Monthly. Gloucester Telegraph. Hardwicke's Science Gossip. Haverhill Gazette. Ipswich Chronicle. Lawrence American. Lynn City Item. Lynn Reporter. Lynn Transcript. Nation. Nature. Peabody Press. Sailors' Magazine and Seamen's Friend. Salem Gazette. Salem Observer. Salem Post. Salem Register. Turner's Public Spirit.

The PRESIDENT in his opening remarks alluded to the great pleasure the Institute derives in holding a field day in this town or vicinity, a locality rich in all that interests the student of Natural History. The woods on the one side, and the sea-shore on the other, offer an extensive field for observation and study. Meetings have been occasionally held near this great belt of woods that stretches back from the town and extends somewhat parallel with the coast from Beverly to Gloucester. In one part are the Chebacco ponds, a cluster of lovely lakes lying within the limits of the towns of Essex,

Hamilton and Wenham; in another the swamps where the magnolia grows in superb luxuriance, and also near the foot of the trunks of some of the lofty pines and hemlocks that little alpine plant, the *Linnæa borealis*, is found; thus representatives of the flora of the North and of the South find here a congenial soil. He spoke of his familiarity with, and wanderings through, these woods and along these shores some thirty or more years since, and noted some of the great changes that have occurred, especially by the opening of the railroad, thus rendering available the land adjacent to the rocky cliffs of the coast for the summer residences of the citizens of the metropolis. He recalled some of the incidents of the early field meetings in this town, and paid a passing tribute of respect to several of those who then took an active part in our doings and have long since ceased from their labors.

The President then called upon Vice President F. W. PUTNAM, who in response said that he had not had the opportunity for a ramble, as he did not arrive until noon. He had, however, seen a number of Indian articles in the house of General Tannatt, by invitation, and he had been much interested in a human skull found in Colorado and now in the General's collection. This skull so closely resembled the ordinary form of the Algonquin Indians, such as are found in the Indian burial places in Massachusetts, as to lead to the belief that it had belonged to an Indian of the same great family with our New England tribes, though it was very venturesome to attempt to place an isolated human skull in its proper ethnic group.

Mr. Putnam then gave a general account of the several forms of skulls prevailing among the American tribes, and extended his remarks to a brief general review of

Indians and Eskimos, and their resemblances to others of the great Mongolian race.

The PRESIDENT remarked, that, in this centennial year of the Republic, the reminiscences of the past involuntarily come to our recollection. On this occasion, those relating to the early botanists would especially claim our consideration.

One hundred years since, the far-famed Rev. Dr. M. Cutler, then the minister of the Hamlet Parish in Ipswich, since incorporated as the town of Hamilton, roamed through these woods and was undoubtedly collecting the materials for his paper, published in 1784, in the first volume of the *Memoirs of the American Academy*, entitled "An Account of some of the Vegetable Productions naturally growing in this Part of America, botanically arranged." Some fifty years since William Oakes of Ipswich, one of the most distinguished botanists of New England, was collecting the plants of this region. His writings on these subjects, and the beautifully preserved specimens in his herbarium which he liberally distributed, gave to these woods a world-renowned reputation as one of the natural flower gardens of America.

The President then called upon Mr. JOHN ROBINSON to give some account of the botany of this vicinity.

Mr. ROBINSON, in comparing the flora of Essex County, particularly that of Cape Ann, with more Northern and Southern regions, said :—

We have here representatives of both the White Mountain and New Jersey plants. Of the species growing at the base of the White Mountains, there are several Ferns and Lycopods, two species of *Viburnum*, the Striped Maple, American Yew, Red-berried Elder, and many

others; while along the coast the Alpine *Potentilla* is often found.

Of the southern species we have the *Magnolia glauca*, Yellow Thistle, and perhaps a few others. The White Cedar (*Cupressus thyoides*) reaches here its northern limit, and its name is in Maine and New Hampshire transferred to the Arbor Vitæ (*Thuja occidentalis*), which has been the cause of much confusion.

Mr. Robinson spoke of the water plants and those of the seashore, stating that there was a much larger number of species to be found than most persons supposed, and considering the natural features of the region, the Essex Flora might claim to be a very rich one.

The carnivorous habits of the *Drosera* were then described with the aid of a diagram. If an insect alights on the leaf, the tentacles, one after another, curl over and entrap it. The insect is digested by the plant and then the leaf opens again.

Darwin's experiments with this plant were then explained. He tried placing various substances upon the disc. Meat, he found, was enclosed and digested. Glass was enclosed for a certain time and then rejected.

Blowing hard upon the plant had no effect upon it. The secretion he found was almost exactly like animal pepsin.

In another genus nearly allied to *Drosera*, the *Dionæa*, the leaves fold over and inclose insects, which are then digested; but in this case the leaves are partly open at the edges, so that small insects can escape, the larger ones only being held. These leaves will repeat the process two or three times. Two species of *Drosera* are common in this locality.

The remarks were closed with some notice of a cone which was imbedded in the wood of the tree, and exhib-

ited by Col. Tannatt. The wood had grown for twenty-five years in order to entirely cover the cone.

Prof. E. S. MORSE made some additional remarks concerning the *Drosera*. It may be put to sleep by application of ether; paralyzed by pricking at a certain point; and may even be given a fit of dyspepsia by giving it certain kinds of food. Prof. Morse also described the manner in which grasshoppers make their peculiar chirping noises, and the notes they utter. Sometimes we are almost deafened by the noise they make. This is produced by rubbing the legs up and down against the wings. The rasping vibrating surface makes the noise we hear. It is so high in pitch no musician has yet recognized its key. In fact some persons cannot hear it; they are sound-blind to sounds of so high a pitch. If a whistle be sounded in presence of a large number of people at a successively higher and higher pitch, there will be finally some who cannot hear it, and as the pitch is raised higher still a larger number of persons will cease to hear it. The crickets rub the upper wings against the under. They have a note for sunlight, and a different one for cloudy weather. The males are in this case the singers. The cicada sings by means of a tendon stretched across a membrane which vibrates like a drum when the tendon is pulled or twitched rapidly. The vitality possessed by some of these insects was dwelt upon. A young lady of Salem, in making a preparation of a grasshopper, discovered that after the head was removed, carrying with it all the interior portion of the body (disembowelling it in fact, so that only the outer skin or shell with the wings remained), certain nerve centres in the rings of the shell upon being pricked caused the wings to flutter rapidly for some time.

Rev. GEORGE L. GLEASON, of Manchester, extended greeting to the members of the Institute. Natural History was out of his line and he had never given much attention to local history. He referred to Mr. John Lee and Mr. Lewis N. Tappan, both of Manchester, as more acquainted with the history of the town.

The President then called upon the Rev. JAMES FREEMAN CLARKE, who was present and responded as follows:

I am much obliged, Sir, for the honor you do me, but I feel like one who finds himself among a race whose language he does not understand. I should be very glad instead of using my own voice to hear more from Prof. Morse about the voice of the grasshopper. Little was known in my younger days about these things of science.

We were taught at Cambridge something of chemistry, and a very little about geology and mineralogy. But I remember when I first went to live near the Falls of the Ohio, I one day found what I supposed to be a petrified wasp's nest or enormous honeycomb; but I was surprised afterwards to learn that it was a fossil. In botany we were taught, at Cambridge, only the Linnæan system; and it amounted to learning the names of orders, genera, etc., and we found it not very interesting. Professor Nuttall was there then, but we never had any teaching from him.

I was reminded while listening to Mr. Putnam's account of the evidence of the movements of races on this continent, derived from the characteristics of the Indian skulls found in different parts of the country, of that collateral branch of knowledge, comparative philology, by which we study the linguistic characteristics of races. Perhaps some of you may not know how much light has been thrown upon the history of the human race by that

study. If we had been told a few years ago that we could go back so far (some two or three thousand years before authentic records) in the history of our race, by the study of language, we should have thought it a most amazing statement. But such is the fact, as I can show you in a few minutes.

It was formerly thought that the Latin came from the Greek, but we now know that it is the oldest language of the two. It has long been known that there are words in the Teutonic languages which have a remarkable relation to words in the Latin and Greek languages; but this was not understood till the Sanskrit language began to be studied. Sir William Jones found that the principal languages of Asia and Europe had a common origin. Sanskrit was at first believed to be the original parent language, but it was afterward found to be the elder sister. After that was studied we could explain many of the irregularities of the Greek and Latin words. This is very apparent in the formation of the substantive verb, to be. The Latin "Sum, Es, Est" was so irregular that it was thought by the elder grammarians that "Es," and "Est," must come from some obsolete root. But in Sanskrit we find it "Asmi," I am; "Asi," Thou art; "Asti," He is,—which makes the derivation of the second and third persons plain. In the Zend, or ancient Persian, it is "Ahmi, Ahi, Asti." In the Gothic it is "Im, Is, Ist." In the Slavic "Yesmi, Yesi, Yesto." In the Irish it is "Esmi, Essi, Esti." So the English word "Daughter" is in Sanskrit, "Duhitar;" while in Greek it is "Thugateer." Here the Zend, which is "Dughter," gives the connecting link. We now know what the ancient Greeks did not themselves know,—the origin of this word of theirs. In Sanskrit it means, not only "Daughter," but also "Milkmaid." The ancient Arians, a pastoral people,

and keeping many cows, employed their daughters to milk, and so the one word was employed in both meanings.

But there are some words in each language entirely distinct and peculiar to it. We see the reason of this. When the first parent race emigrated from central Asia and swept on westward, branches turned off in various directions, one to the south, another to the southwest, others to the southeast and southwest of Europe, etc. Branches flowing to the north formed the great Celtic, Slavic and Teutonic races.

When these tribes separated from the parent stock they must have taken with them the civilization which they had before separating. So the several branches or varieties carried with them the same words for common things which they all had when together, such as the word for "House," showing that they lived in houses before migrating from their ancient homes. Thus too we find that there are similar words in all these great linguistic streams for ox, horse, sow, mouse, wheat, clothes, the numerals one, two, three; also for plough, hatchet, hammer, gold, silver, copper, tin. But when we find the names of the same thing differing in all these tribal languages, we may be confident that the original race knew nothing of it, and did not use it. Such words as that for *sail*, or that for *boats*, propelled by other means than simple oars, are not found common to all; hence they did not have sails or sail boats when together.

The result of such unexpected new discoveries in so old a science is finally to bring us to the conclusion that there is no end to knowledge. The discovery of some new instrument or method of investigation will open to us means of increasing our knowledge. In our time the wonderful discovery of the meaning of the lines in the

solar spectrum has enabled us to do what we never could have done before, or imagined possible to have done. There is no reason for doubting that many similar potent instruments for penetrating the mysteries of Nature are yet to be discovered.

I thank you, ladies and gentlemen of the Essex Institute, for listening to me so patiently, and wish you all success in your studies in these deeply interesting departments of knowledge.

Mr. RICHARD H. DANA being called upon, after disclaiming any special knowledge of the subjects discussed, saying that he could make out as clear a case of ignorance of scientific questions as could Dr. Clarke, related in confirmation of this an incident at his father's house after he had graduated. President Woolsey, who was our guest, asked me if I had seen, in California, the *cactus*. Not knowing what the cactus was, I endeavored to get over the difficulty by saying that I had not been in the interior where the rich lands and gardens were, but on the dry, sandy seacoast. My family were somewhat disturbed, they being aware, as I was not, that the cactus grew in just such dry, sandy places. I then described a large "prickly pear," with its beautiful flower and blossoms, which we found on the coast, and this, to my confusion, was the cactus itself.

As Dr. Clarke has said, we collegians thought moral science the only important study. After graduating at Harvard I thought of taking a course in philosophy with Professor Marsh, at Burlington, Vt. He asked me what I knew of natural science. I told him, nothing. To teach moral and intellectual philosophy thoroughly (he said) there must be a ground-work of the natural sciences. The laying of this foundation, I found, would take too much time, and I did not attempt his comprehensive course.

I therefore can contribute nothing to your purposes. But when I have such an opportunity to come and listen to such discussions I like to take advantage of it.

If I shall not be occupying too much of your time, Mr. President, I will give an account of my visit to the volcano of Mauna-Loa during the eruption of 1859, for the most illiterate savage can describe what he has seen. The lava flowed through a tortuous course of forty miles in length. I procured the services of two natives with their boat to take me to the place where it emptied into the sea. On arriving near the place the scene became one of the utmost grandeur. There was no moon, but the stars shone with that brightness which is never seen outside of the tropics. There was a light and pleasant breeze. The space which the lava occupied, as it descended into the sea, was three miles in width; that is to say, not in an unbroken line, but pouring in, sometimes at one end, sometimes at the other, and again in the middle. The lava cools on the surface quickly and assumes a dark lead color, but where it is hot and flowing, or where this crust is broken through, it shows a beautiful scarlet or blood-red color. As the lava flows slowly along it meets with obstructions and resisting forces which for a time create a barrier; but after a while having risen higher than the obstruction, it overflows, and finally carries away the débris and bears it along in its course, where it tumbles over, sometimes from a considerable height, a mass of lava, earth and stone; and, with a loud hissing noise, accompanied by a series of explosions like the rattling of small arms along a line of battle, plunges into the sea. The molten lava heats the sea, so that it was appreciable even at the distance I was, not less than a mile away. I endeavored to induce the men to take the boat nearer, but nothing that I could offer prevailed upon them to do so. This reluctance arose partly from their supersti-

tion; the volcano being the residence of their goddess Pelé, whose anger was evinced by its thunderings and eruptions. They gave, however, as an excuse for not approaching nearer, that the heat of the water would melt the pitch from the seams of the boat, and that we should all sink. Of this of course there could be no danger, for I found upon placing my hand in the water that it was just a little warm.

Imagine such a scene here; the mountain forty miles away. You hear of the approach of the lava from day to day, for it moves slowly in its course to the sea. When it reaches Manchester it destroys this place utterly, removing all that is before it, the houses and all the work of men's hands; the harbor, creeks and all vegetation, involved in one general destruction. In the process of time the lava cools and cracks; vegetation starts in the seams and crevices of the surface, and finally a new soil covers it; and you have a new harbor, a new soil, and a new town, perhaps a mile or two farther into the ocean.

Mr. LEWIS N. TAPPAN was called upon and gave a brief sketch of the local history of Manchester. It was first settled in 1626 by a few fishermen from Cape Ann, William Jeffries, William Allen, William and John Norman and others. It was called Manchester simply because many of the settlers came from Manchester in England. Mr. Tappan thought some more appropriate name, like *Magnolia*, or *Masconomo* (the name of the Indian chief who brought strawberries to Gov. Winthrop's party, which landed here on their way to Salem in June, 1630), would have been better. He then referred to the partial destruction of the schooner "Nancy," by the British, at Mingoe's beach, A. D., 1813, and to the fight between the Chesapeake and Shannon, and other naval engagements that have occurred near the Manchester shore.

Rev. C. A. BARTOL remarked that he had great pleasure in seeing the cup of this communion table passing round. There should be no war between science, philosophy and religion. All meet on common ground in pursuit of knowledge. Philosophy must reign, but must not govern. It has no right, as religion has no right, to shut out any facts that knowledge finds. Religion reigns over all, but without injustice to any. Life is the nearest fact, the most universal thing. The mountain crumbles, but the plant springs up and insects grow. The trees, the beasts, and the men are of one stuff. Who can say what of the mountain is in the man? What of granite in the plant? What shall we say of the notion of a Deity as out of matter? This precipitate of mind into matter ever tends to go back into mind. The Agassiz Boulder suggests the saying that Queen Elizabeth's mind was like one of those Druidical rocking-stones, which the slightest touch can disturb, but the greatest power could not overthrow. I know a tree near here, three hundred, perhaps five hundred, years old. We think the tree is the weak yielding thing. But we know very well how this tree clings to the rock and sucks food from it, as the child from its mother's breast. No doubt in those five hundred years that ledgo has changed very much. The rock has crumbled, but the tree remains. The great sentiments, the religious sentiments, will survive after all these hard elements of nature have melted and changed and passed away. Here is illustrated the immortality of the principle of life.

The time drawing near for the arrival of the train for Salem, the meeting adjourned, after having passed a vote of thanks, offered by Mr. W. P. UPHAM, to the town authorities and to the citizens for their kindness and courtesies.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 8. SALEM, MASS., SEPT., OCT., NOV., 1876. No. 8.

One Dollar a Year in Advance. Ten Cents a Single Copy.

REGULAR MEETING, MONDAY, OCTOBER 2, 1876.

MEETING this evening at 7.30 o'clock. PRESIDENT in the chair. Records of preceding meeting read.

Mrs. Charles Arey and Mr. John P. Reynolds of Salem were elected resident members.

Mr. ARTHUR W. FOOTE was elected the curator of Music, vice Mr. C. H. HIGBEE who declined a reelection.

Mr. W. D. NORTHEED stated that Mr. R. S. SPOFFORD of Newburyport, had discovered a curious oven on or near his grounds, and would like to have the Institute examine it. He also tendered Mr. Spofford's invitation to the Society to hold a field meeting at his place.

Mr. JAMES KIMBALL presented several coins.

ESSEX INST. BULLETIN.

VIII

7

(77)

Mr. F. W. PUTNAM, in behalf of the author, presented the following communication:—

LIST OF BIRDS COLLECTED BY MR. CHARLES LINDEN, NEAR SANTAREM, BRAZIL.—By J. A. ALLEN.

IN February, 1873, Mr. Linden left New York for Pará, Brazil, for the purpose of collecting objects of Natural History. Arriving at Pará at the height of the rainy season, he found the constant rains and the inundated state of the country highly unfavorable for his work, and soon pushed on to Santarem, on the Amazon, five hundred miles west of Pará. Here he found the conditions for work more favorable, and adopted this point as the scene of his labors, spending most of his time here from early in April till the end of July. In June he made an excursion to Rhomes, sixty miles distant, where he spent a few weeks, and in August passed a short time collecting at Anjos and Marajo, at the mouth of the Amazon. The chief part of the collection was hence made at Santarem, in the campos and sparsely wooded region of the immediate vicinity. The notes added are those accompanying the specimens. The collection was made chiefly under the auspices of the Museum of Comparative Zoölogy, Cambridge, Mass., where the greater part of Mr. Linden's collection of birds still remains. The collection embraced two hundred and fourteen specimens, representing one hundred and twenty-eight species.

- ✓1. *Turdus albiventrís* Splx.¹
2. *Mimus saturninus* Licht. Santarem, April 12; common.
- ✓3. *Donacobius atricapilla* (Linn.). Santarem.
- ✓4. *Vireosylwia agilis* (Licht.). Rhomes², June 18; common.
- ✓5. *Dacnis cayana* (Linn.). Santarem, April 12; common.
- ✓6. *Calliste cayana* (Linn.). Santarem, April 12 and June 2; common in thickets.
- ✓7. *Tanagra episcopus* Linn. Santarem, April 12 and June 6; common in thickets.
- ✓8. *Tanagra palmarum* (Max.). Santarem, June 5; common in woods and thickets.
- ✓9. *Ramphocælus jacapa* (Linn.). Santarem, Marajo and Para; common.
10. *Lanio atricapillus* (Gm.). Santarem, May 27; not common.
11. *Tachyphonus cristata* (Gm.). Santarem, May 27; in small flocks in thick woods.

¹The nomenclature adopted in this paper is, with few exceptions, that of Messrs. Selater and Salvin's "Nomenclator Avium Neotropicalium."

²A plantation so-called, mentioned in Mr. Linden's notes as being sixty miles from Santarem.

12. *Spermophila castaneiventris* (Cab.). Santarem, May 1; found among the reeds along edge of the Amazon River.

13. *Spermophilus mysta* (Vieill.). Santarem, June 5; common in the vicinity of the town.

14. *Paroaria gularis* (Linn.). Santarem, May 1; rather common in the campos.

15. *Sycalis columbiana* Cab. Santarem, April 12; in small flocks on the campos.

16. *Ostinops yuracarium* (Laft. & d'Orb.). Santarem.

17. *Ostinops cristatus* (Gmel.). Santarem, May 15; common.

18. *Cassicus persicus* (Linn.) Santarem, April 10; common and in full plumage.

19. *Icterus croconotus* (Wagl.).

20. *Molothrus bonariensis* (Gm.). Santarem, June 5; common near the town.

21. *Gymnomystax melaniotus* (Vieill.). Rhomes, June 13; Marajos, August 1; common.

22. *Leistes guianensis* (Linn.). Santarem, May 1-24; common.

23. *Cassidix oryzivora* (Linn.).

24. *Taniptera nengeta* (Linn.). Campos near Anjos (eastern part of the island of Marajos), Aug. 1.

25. *Taniptera velata* Licht. Marajos, August 1; open campos, rare.

26. *Arundinicola leucocephala* (Linn.). Rhomes, June 28; common near the reeds along the Tapajos River.

27. *Elainea pagana* (Licht.). Santarem, June; very common.

28. *Myiodynastes solitarius* (Vieill.). Santarem, May 19; common about clearings.

29. *Megarhynchus pitangus* (Linn.). Santarem, May 23; common in clearings near deep woods.

30. *Myiarchus tyrannulus* (Muell.). Santarem, May 23; common.

31. *Myiarchus nigriceps* Scf. Santarem, May 23; common.

32. *Empidonax varius* (Vieill.). Santarem, June 2; common on the outskirts of woods.

33. *Tyrannus niveigularis* Scf. Santarem, April 12; common in the open campo.

34. *Milvulus tyrannus* (Linn.). Marajo, August 5; very common.

35. *Pipra*, sp. incog.

36. *Titra personata* Jard. & Selby. Santarem, May 24; common in flocks in deep woods.

37. *Pachyrhamphus cinereus* (Bodd.). Santarem, June 5; common near the town.

38. *Phanicrocerus carnifex* (Linn.).

39. *Querula cruenta* (Bodd.). Santarem, May 18; rare, in deep woods.

40. *Furnarius*, sp. incog.
41. *Dendronis multiguttata* (Laf.). Santarem. April 20; common.
42. *Picolaptes bicittata* (Licht.). Santarem, April 8; common in thickets.
43. *Thamnophilus luctuosus* (Licht.).
44. *Thamnophilus doliatus* (Linn.). Marajo, August 10.
45. *Chondestes torquata* (Bodl.). Deep woods near Santarem, May 19; common.
46. *Eupetomena macrura* (Gm.). Campos near Santarem, April 20; common.
47. *Lampornis gramineus* (Gm.).
48. *Lampornis mango* (Linn.). Marajo, August 10; common.
49. *Thalurania nigrofasciata* Gould.
50. *Eucephala cerulea* (Vieill.).
51. *Thaumatias linnæi* Bon.
52. *Podager nacula* (Vieill.).
53. *Chordeiles acutipennis* (Bodl.). Common in the campos near Anjos, August 2.
54. *Stripops ruficollis* (Sci.).
55. *Picumnus minutus* (Linn.). Marajo, August 10; common.
56. *Campephilus melanoleucus* (Gm.). Santarem. June 5; common.
57. *Celeus citrinus* (Bodl.). Santarem, in deep woods, April 10; common.
58. *Momotus brasiliensis* Lath. Rhomes, June 29; common in deep woods.
59. *Ceryle torquata* (Linn.). Santarem, June 5; common.
60. *Ceryle amazona* (Lath.).
61. *Ceryle americana* (Gm.). Santarem, May 1; rather rare.
62. *Ceryle superciliosa* (Linn.).
63. *Trogon melanurus* Sw. Santarem. May 18; common.
64. *Trogon merulionalis* Sw. Santarem, May 22; deep woods, rare.
65. *Trogon viridis* Linn. Rhomes, June 28; common.
66. *Galbula viridis* Lath. Santarem. April 10; common near streams.
67. *Bucco tamatia* (Gm.). Rhomes, June 9; deep woods, rare.
68. *Monasa morphens* (Hahn). Santarem (May 21), and Rhomes, June 29; common in deep woods.
69. *Monasa nigricollis* (Spix). Santarem, April 12; common in small flocks about plantations.
70. *Chelidoptera tenebrosa* (Pall.). Campos about Santarem, April 20.
71. *Crotophaga ani* Linn. Rhomes, June 28; common, in small flocks.
72. *Crotophaga major* Linn. Rhomes, June 18; in small flocks.
73. *Diplopterus navius* (Gm.). Marajo, August; in small flocks of four to seven or eight.

74. *Dromococcyx pavoninus* Pelzeln.

75. *Piaya cayana* (Linn.). Santarem, April 18; common in thickets.

76. *COCCYGUS LINDENI*, n. sp.

Above olivaceous-gray, with bronzy reflections, and tinged with ash on the head; beneath cinereous, fading to white over the abdomen; remiges wholly without rufous; under side of wings with a faint ochraceous tinge at the base of the quills; outer rectrices black, broadly tipped with white; middle pair like the back, wholly unicolor (not darker at the tip as in *C. americanus*). Upper mandible and tip of lower black; rest of lower mandible and the edge of the upper at the base, yellow. Tail much graduated, the middle rectrices being 1.75 longer than the outer. Length, 10.50; wing, 5.15; tail, 5.50.

This species more closely resembles *C. americanus* than any other well-described species, from which it differs in its considerably smaller sides, in the total absence of rufous in the remiges, and in the strongly cinereous color of the lower parts. The bill and the tail are colored precisely as in *C. americanus*, except that the middle pair of rectrices are unicolor, instead of darker near the tip. The dorsal surface is also of a rather darker tint, with rather more ash on the head.

This species seems to also bear a close resemblance to *C. eulerti* Cab. (Journ. f. Orn., xxi Jahrgang, p. 72, Jan., 1873), with which it may prove to be identical, but Cabanis's very meagre description is insufficient to enable me to fully decide. I hence adopt a provisional name for the species above described. Cabanis's specimen of *C. eulerti* was obtained at a far more southern locality,—Cantagallo, in the Province of Rio de Janeiro.

Of the *C. lindenii* I have but a single example, collected by Mr. Linden, in whose honor I have named the species, at Santarem, April 19, 1873.

77. *Rhamphastos erythrorhynchus* (Gmel.). Santarem, April and May; common in the forests.

78. *Rhamphastos arty* Vieil. Santarem, June 5; common in deep woods.

79. *Pteroglossus aracari* (Linn.). Santarem; common in the forests.

80. *Selenidera maculirostris* (Licht.). Santarem, May 18; common in deep woods.

81. *Ara ararauna* (Linn.). Santarem.

82. *Ara macavanua*. Marajo, August 1; rare, in small flocks.

83. *Conurus aureus* (Gm.). Santarem, April 10; in small flocks.

84. *Conurus roseifrons* Gray. Santarem, May 28; in small flocks.

85. *Brotoperys trescens* (Gm.). Santarem, April 15; common.

86. *Psittacula passerina* (Linn.). Santarem, June 1; seen in small flocks.

87. *Pulsatrix torquata* (Daud.).

88. *Asturina nitida* (Lath.). Santarem, July 12; in deep woods.
89. *Asturina natterii* Sci. & Salv. Rhomes, June 10; near clearings.
90. *Spizæus ornatus* (Daud.). Rhomes, June 28; rare.
91. *Accipiter bicolor* (Vieill.). Santarem.
92. *Hypotriorchis ruficularis* (Daud.). Santarem, May 21; deep woods, rare.
93. *Iarpagus diodon* (Temm.). Santarem, May 1.
94. *Milvago chimachima* (Vieill.). Anjos, August 3; campos, rare.
95. *Polyborus tharus* (Mol.). Rhomes, June 20; rare. Iris, light brown.
96. *Cathartes aura* (Linn.). Marajo, August; common.
97. *Plotus anhinga* Linn. Marajo, August 3; common.
98. *Ardea coccy* Linn.
99. *Ardea egretta* (Gm.). Santarem.
100. *Ardea candidissima* (Gm.) Santarem, May 1; singly, near the banks of the Amazon.
101. *Tyrisoma brasiliense* (Linn.).
102. *Cancroma cochlearia* Linn. Marajo, August 5; common.
103. *Ciconia maguari* (Gm.).
104. *Tantalus loculator* Linn.
105. *Ibis rubra* (Linn.). Marajo, August 5; common.
106. *Theristicus melanops* (Gm.).
107. *Platalea ajaja* (Linn.). Anjos, August 1; common in small flocks.
108. *Columba rufina* (Temm.). Rhomes, June 13; in small flocks; not common.
109. *Zenaida ruficauda* Bon. Santarem, June 1; in small flocks on the campos.
110. *Chamæpelia passerina* (Linn.). Santarem, June 5; common in small flocks.
111. *Chamæpelia talpacoti* (Temm.). Santarem and Rhomes, in small flocks about clearings.
112. *Leptoptila rufaxilla* (Rich. & Bern.). Santarem, June 6; seen singly, and apparently not common.
113. *Pipile cumanensis* (Jacq.). Santarem, May 10; deep woods; not common.
114. *Ortalia ruficeps* Wagl.
115. *Odonotophorus guianensis* (Gm.). Santarem, May 27; not common.
116. *Aramides mangle* (Spix).
117. *Porphyrio parvus* (Bodd.). Rhomes, June 13; common, in small flocks.
118. *Eurypyga helias* Pallas.
119. *Parra jacana* (Linn.). Santarem, May 4; common.

- ✓ 120. *Vanellus cayanensis* (Gm.).
 ✓ 121. *Actitis collaris* (Vieill.). Anjos, August 5; rather rare.
 122. *Gallinago frenata* (Max.). Marajo, August; common in marshy grounds, in small parties of three to five individuals.
 123. *Breunetes petrificatus* (Ill.). Marajo, August 4; common in flocks.
 124. *Gambetta flavipes* (Bon.). Marajo, August 10-20; common in flocks; extremely shy.
 125. *Tringoides macularius* (Linn.). Santarem, April 12; common along the river banks. Specimens were obtained both in the mature and immature plumage.
 126. *Crypturus cinereus* (Gmel.). Santarem, July 6; common in deep woods.
 127. *Crypturus obsoletus* (Temm.).
 128. *Crypturus pileatus* (Bodd.).



REGULAR MEETING, MONDAY, OCTOBER 16, 1876.

Meeting this evening. The PRESIDENT in the chair. In the absence of the Secretary, Mr. WM. P. UPHAM was chosen Secretary *pro tem*. Records of preceding meeting read.

Mr. J. S. Kingsley, of Salem, was elected a resident member.

Dr. F. H. Hance of Whampoa, China, was elected a corresponding member.



REGULAR MEETING, MONDAY, NOVEMBER 6, 1876.

MEETING this evening. The PRESIDENT in the chair. Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From F. E. Abbot, Boston, Sept. 6; J. A. Allen, East Jaffrey, N. H., Aug. 13; E. P. Boon, New York, Nov. 1; P. S. Boothby, Philadelphia, Aug. 15, Sept. 1, 6, Oct. 1, 4; Bresl, Bureau de la Commission de l'Empire; Bruxelles, Acad. Roy. des

Sciences, des Lettres, et des Beaux-arts de Belgique; Buffalo Historical Society, Sept. 7, 25; Cook, Son & Jenkins, Philadelphia, Aug. 15; James T. Cranx, Indianapolis, Sept. 23; Davenport Academy of Natural Sciences, Sept. 15; George D. Dimon, Utica, Sept. 1; L. P. Farmer, Philadelphia, Sept. 6, 30; Samuel A. Green, Boston, Aug. 14; Frankfurt, Senckenbergische Naturforschenden Gesellschaft, Feb. 26; Harvard College, Museum of Comp. Zoology, Oct. 11; T. W. Higginson, Newport, R. I., Oct. 5; Ernest Ingersoll, New York, Sept. 27, Oct. 11; A. C. Kendall, Boston, Sept. 13; George Collins Levey, Philadelphia, Oct. 16; George Lincoln, Hingham, Sept. 19; Lisbonne, Acad. Royale des Sciences, Aug. 23; J. Dewitt Miller, Cross River, N. Y., Oct. 24; London, Society of Antiquaries, Oct. 16; Lyons, Société d'Agriculture, Histoire Naturelle, et Arts Utiles, July 20; New Hampshire Historical Society, Sept. 9; New Jersey Historical Society, Sept. 6, Oct. 11; New York Historical Society, Sept. 8, Oct. 13; New York Mercantile Library Association, Oct. 11; Ohio Historical and Philosophical Society, Sept. 7, Oct. 13; Samuel C. Oliver, Philadelphia, Aug. 19; George B. Phippen, Boston, Aug. 20, Sept. 7; John S. Pierson, New York, Oct. 10; H. J. Pratt, Chelmsford, Sept. 6; F. W. Putnam, Cambridge, Oct. 24; Aaron Richardson, Unionville, Missouri, Sept. 4; Thos. S. Roberts, Minneapolis, Minn., Oct. 29; D. A. Rogers, Chicago, Ill., Oct. 18; W. Hudson Stephens, Lowville, N. Y., July 16; Wm. W. Stewart, Buffalo, N. Y., Sept. 29; Stockholm, Acad. Roy. Suedoise des Sciences, July 6; Thomas R. Trowbridge, New Haven, Conn., Sept. 6; United States Centennial Commission, Philadelphia, Oct. 9; Vermont Historical Society, Sept. 7, Oct. 12; Williams' Lecture Bureau, Boston, Sept. 3.

The LIBRARIAN reported the following additions:—

By Donation.

- ABBOT, F. E., OF BOSTON. Index, Vols. 5, 6, 1874, 1875. 2 vols., folio.
 BOARDMAN, SAM'L L., OF AUGUSTA, ME. Report of the Maine Board of Agriculture, 1872, 1873, 1874. 3 vols., 8vo.
 BOLLES, E. C. Universalist Register, 17 numbers. Centennial Eagle, Aug. 22, 29, Sept. 5. Miscellaneous pamphlets, 5.
 BUFFALO YOUNG MEN'S ASSOCIATION. Catalogue of the Library. 1 vol., 8vo. Buffalo, 1871. First Supplement to the Catalogue. 8vo. 1872. Annual reports of 3 pamphlets.
 FOSTER, W. J. American Agriculturist, 1867 to 1873. Cultivator and County Gentleman, 1870 to 1875. The Horticulturist, 1859 to 1866. Journal of Health, 1859 to 1864. New England Farmer, 1859 to 1864.
 GOSS, ELBRIDGE H., OF MELROSE, MASS. Historical Address at Melrose, July 4, 1876, by donor. 8vo.
 GREEN, S. A., OF BOSTON. Historical Address at Groton, July 4, 1876. Miscellaneous pamphlets, 8.
 HART, C. F., OF PHILADELPHIA. Miscellaneous pamphlets, 15.
 HUNT, T. F. Reference Catalogue of Current Literature. 1 vol., 8vo. Genealogy of the Hunt Family. 1 vol., 8vo. Christian Lyre and Supplement. 1 vol., 12mo. History of Miss Meredith, Vol. I. 1 vol., 8vo. The Jilt. 1 vol., 8vo. Jubilee Memorial. 1 vol., 8vo. Anglo-Chinese Calendar, 1851. 2 vols., 8vo.
 INDIANA GEOLOGICAL SURVEY OF. Report for 1873, by E. T. Cox. 1 vol., 8vo.
 KIMBALL, JAMES. Cape Ann Advertiser, July, Aug., Sept., 1876. Proceedings of the G. Roy. Arch Chapter of Massachusetts, Jan.,—Dec., 1874, Mar. 9, Dec., 1875.
 LAWRENCE, ABBOTT, OF BOSTON. Journal of a Tour to Niagara Falls in 1803, by Timothy Bigelow. 1 vol., 8vo.
 LEE, JOHN C. Commercial Bulletin, June, July, Aug., Sept., Oct., 1876.

- MANNING, RICHARD C. *Boston Daily Advertiser*, Aug., Sept., 1876.
- MERRITT, L. F. *Essex County Mercury*, Sept., Oct., 1876.
- MILLS, ROBERT C. *Whitaker's Almanac*, 1873, 1875, 1876. *Christian Observatory*, 9 numbers.
- NEWHALL, THOMAS A., OF GERMANTOWN, PENN. *England and Wales, Returns of Owners of Land*, 1873. 2 vols., 4to.
- NORTHEY, W. *The Spectator*, 49 numbers.
- OLIVER, S. C. *Fifth Annual Report of Railroad and Warehouse Commission of Ills.*, 1875. 1 vol., 8vo. *Report of Supt. of Public Instruction of Cal.*, 1871-75. 1 vol., 8vo. *Prisons and Penitentiaries*, 1876. 1 vol., 8vo. Miscellaneous pamphlets, 35.
- OURT, ANDREW J., OF HARRISBURG, PENN. *Report of the Board of Public Charities of Penn.*, 1876. 1 vol., 8vo.
- PALFRAY, C. W. *Every Saturday*, 67 numbers. Miscellaneous pamphlets, 51.
- PERKINS, SAM'L C., OF PHILADELPHIA, PENN. Miscellaneous pamphlets, 3.
- PIPPEN, GEO. D. *Public Documents and Directories*, 23 vols. 8vo.
- PUTNAM, MRS. EBEN. Miscellaneous books, 69 vols. Pamphlets, 335.
- PUTNAM, F. W. *New York Tribune*, June, July, Aug., 1876. Miscellaneous papers, 13.
- QUINCY, EDMUND. *Speeches delivered in the Congress of the U. S. by Josiah Quincy, 1803-1813*. 1 vol., 8vo.
- ROBINSON, JOHN. Miscellaneous pamphlets, 75.
- SEWALL, C. C., OF MEDFIELD, MASS. *Bi-Centennial of the Burning of Medfield*, 1674, 1876. 8vo.
- SPOFFORD, A. R., OF WASHINGTON, D. C. *Catalogue of Books added to the Library of Congress, 1872-75*. 1 vol., 8vo.
- STICKNEY, M. A. Miscellaneous College pamphlets, 8.
- STONE, B. W. *Boston Directory*, 1833. 1 vol., 8vo. *Exeter and New Market*, 1833. 1 vol., 8vo.
- TROWBRIDGE, THOMAS B., OF NEW HAVEN, CONN. *Genealogy of the Trowbridge Family*. 1 vol., 8vo.
- UNKNOWN. *The New Century for May, June, July, Aug., Sept., Oct.*, 1876.
- U. S. DEPARTMENT OF STATE. *Reports upon the Vienna Exposition in 1873*. 4 vols., 8vo.
- U. S. ENGINEER DEPARTMENT. *U. S. Geological Survey, Zoology, Vol. V*. 1 vol. 4to.
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Mrs. Grace A. Ellis, of Swampscott, was elected a resident member.

Mr. DAVID PINGREE having declined the office of Treasurer, Mr. HENRY M. BROOKS was unanimously elected to the office.

Mr. CALEB COOK presented, in behalf of Mr. J. H. LEFAVOR, a series of twenty photographs of Salem and vicinity.

Mr. ALFRED PEABODY presented, in behalf of Mr. A. S. Peabody, specimens of fishes from Cape of Good Hope.

Mr. T. F. HUNT offered the following :

Whereas, it is understood that the Old South Preservation Committee, of Boston, propose holding an Exhibition of Historical Relics for the benefit of the Old South Fund ; and *whereas*, the Essex Institute wishes to avoid any action which might conflict with such exhibit ; it is

Voted, That the Exhibition of Historical Relics proposed to be holden by the Institute the coming winter be postponed to another season, and the Secretary be instructed to present the thanks of the Institute to Col. F. M. Eiting, of Philadelphia, for his kind offer to loan a collection of valuable relics, and inform him of the reason for postponement.

Vice President A. C. GOODELL offered the following :

Whereas, The Essex Institute has witnessed, with admiration, the labors of those citizens of Philadelphia who have joined in collecting for exhibition during the pro-

gress of the International Exhibition, such historical relics and documents as would tend to excite patriotism, and more strikingly illustrate the progress of our country from the earliest colonial period, be it

Resolved, That the Institute express to Col. F. M. Etting and Charles Henry Hart, Esq., and to those ladies and gentlemen who were associated with them, its high appreciation of the courage with which they undertook, and the discretion, energy and perseverance with which they have conducted the truly National Exhibition at Independence Hall, and in the Academy of Fine Arts in Philadelphia during the past summer.

Resolved, That the Secretary be instructed to present a copy of the foregoing preamble and resolutions to Col. Etting and Mr. Hart, with the request that they will communicate the same to their associates in such manner as they shall find most convenient.



REGULAR MEETING, MONDAY, NOVEMBER 20, 1876.

MEETING this evening. The PRESIDENT in the chair. Records of preceding meeting read.

The subject of lectures the coming season was fully discussed, and a programme was presented by the lecture committee.

Mr. H. H. Edes of Charlestown, was elected a resident member.

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BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 8.

SALEM, MASS., DEC., 1876.

Nos. 9-12.

REGULAR MEETING, MONDAY, DECEMBER 4, 1876.

MEETING this evening. The PRESIDENT in the chair.
Records of preceding meeting read.

The SECRETARY announced the following correspondence:—

From J. A. Allen, Cambridge, Nov.; Belfast Naturalist Field Club, Sept. 7; Charles A. Bemis, Marlborough, N. H., Aug. 3; George B. Blodgett, Rowley, Nov. 20; S. L. Boardman, Augusta, Me., Nov. 17, 27; Henry Breed, Lynn, Nov. 18; Cherbourg, Société Nationale des Sciences Naturelles, Oct. 18; C. Cushing, Boston, Nov. 16; C. W. Eaton, Wakefield, Nov. 27, Dec. 2; Charles Wyllys Elliott, Cambridge, Nov. 1; Grace A. Ellis, Boston, Nov. 18; Emden, Naturforschende Gesellschaft, Sept. 1; Frank M. Etting, Philadelphia, Nov. 20; A. W. Foote, Boston, Nov. 9; A. C. Goodell, Jr., Nov. 25; A. F. Gray, Danversport, Nov. 18; Kjobenhavn, Det K. Danske videnskabernes Selskab, Oct. 17; F. LeBaron, Boston, Nov. 18; J. D. Miller, Cross River, N. Y., Nov. 14; W. S. Nevins, Nov. 22; S. C. Oliver, Philadelphia, Nov. 21; Page Belting Co., Concord, N. H., Nov. 17; J. S. Pierson, New York, Nov. 15, 17, 23, 24; H. Reed, Philadelphia, Nov. 11, 15; Abby S. Richardson, Boston, Nov. 18; T. S. Roberts, Minneapolis, Nov. 16; C. Saltonstall, Nov. 25; Smithsonian Institution, July 26; U. S. Bureau of Education, Nov. 10; J. A. Vinton, Winchester, Nov. 24; Zurich, Naturforschende Gesellschaft, Aug.

Dean Dudley of Wakefield, was elected a corresponding member.

Vice President F. W. PUTNAM presented to the soci-

ety, in behalf of the author, a work by Dr. GEORGE A. OTIS, U. S. Army, containing a list of the human crania and skeletons now in the collection of the Army Medical Museum at Washington. Mr. Putnam said that this work was very complete in the measurements given, and was a valuable addition to the library as a work of reference.

Mr. PUTNAM read a communication on the

BIRDS OF NORTH-EASTERN ILLINOIS.

By E. W. NELSON.

THE region about the southern end of Lake Michigan, in Illinois, presents an unusually fertile field for the ornithologist. Situated, as it is, midway between the wooded region of the East and the treeless plains of the West, with the warm river bottoms of the South, rich in southern species, extending within a comparatively short distance, and the Great Lakes upon the north, North-eastern Illinois forms a kind of "four corners" where the avian-faunæ of four regions intergrade. To the proximity of Lake Michigan we are indebted for a number of more or less strictly maritime species, among the most important of which are, during summer, *Ammodromus caudacutus*, *Ægialitis melodus* and *Anas obscura*, and, during the migrations, *Streptopelia interpres*, *Tringa bontapartii*, *T. maritima*, *T. canuta*, *Calidris arenaria*, with all the common water birds, with very few exceptions, found upon the coast at that season. In winter the list is larger, during which season are found *Histrionicus torquatus*, *Harelda glacialis*, the three species of *Edemia*, *Somateria mollissima*, *S. spectabilis*, *Stercorarius pomatorhinus*, *Larus glaucus*, *L. leucopterus*, *L. marinus*, and *Rissa tridactyla*.

As would be expected, the southern species occur only in summer, with the exception of *Lophophanes bicolor*, which is found only in winter. The principal southern species are: *Mimus polyglottus*, *Parus carolinensis*, *Thryothorus ludovicianus*, *T. bewickii*, *Protonotaria citrea*, *Dendroica* var. *albiflora*, *D. cerulea*, *Oporornis formosus*, *Icteria virens*, *Myiodytes nigratus*, *Pyranga æstiva*, *Collurio* var. *ludoviciana*, *Cardinalis virginianus*, *Centurus carolinus*, *Nauclerus forficatus*, *Rhynogryphus aura*, *Tantalus loculator*, *Gallinula martinica*, *Porzana jamaicensis*, *Sterna regia* and *S. antillarum*.

We have also, either as residents or transient visitants, the following western species: *Myiadestes townsendi*, *Vireo belli* (breeds), *Iles-*

periphona vespertina, *Plectrophanes pictus*, *Ammodromus lecontei*, *Zonotrichia* var. *intermedia*, *Z. coronata*, *Z. querulea*, *Spizella pallida* (breeds), *Eremophila* var. *leucolæma* (breeds), *Sturnella* var. *neglecta* (breeds), *Scolecophagus cyanocephalus*, *Pica* var. *hudsonica*, *Chordiles* var. *henryi* (breeds), *Buteo* var. *calurus* (breeds?), *B. swainsoni* (breeds?), *Tringa bairdii*, *Steganopus wilsoni* (breeds), and numerous others less strictly western.

A belt about twenty-five miles wide, bordering Lake Michigan in Illinois, will include the field of the present paper. A few species taken during the migrations at Racine, Wisconsin, have been added. Although this locality is not situated within the precise limits of the region to which this paper is limited, it being, however, but a few miles north of the Illinois state line, upon the Lake shore and in the direct line of migration, it would seem extremely improbable that a northward bound species taken at Racine should not have passed through the adjacent portion of Illinois.

Not only is the influence of the Lake upon the fauna shown by the occurrence of numerous species of birds, attracted by the presence of a large body of water with its congenial surroundings, but the influence of the Lake upon the climate and the vegetation in its immediate vicinity, has a marked influence upon the list of summer residents.

As is well known, the country bordering upon the Great Lakes possesses an average lower temperature during summer, and a higher temperature during the winter, than the surrounding districts. This has a decided effect upon the movements and distribution of the birds in the vicinity of these large bodies of water.

This influence is seen in a retardation, often of a week or more, in the spring migration, and in the scarcity of small woodland species during the breeding season. Although birds are exceedingly numerous here during the migrations, and the number of species found during the summer compares favorably with the number found at the same season in other localities having the same latitude, they are represented by decidedly few individuals. This fact is especially noticeable after one has passed a day in the marshes of the vicinity, where the abundance of numerous marsh and water birds, both in species and individuals, would lead one to suppose the woods were equally favored.

The limits of the field discussed in this paper embrace two counties, Cook County upon the south, and Lake County upon the north. Each possesses certain topographical peculiarities. Cook County is mainly prairie land, interspersed with ridges and groves of timber, the former of which generally extend parallel to the Lake shore. Near the south-eastern portion of the county the surface of the prairie is but slightly above the level of the lake. Through this county flows the

Calumet river, along which are extensive marshes, which form a favorite haunt for various waterfowl. Along the Lake shore, in north-western Indiana, extending thence slightly into Illinois, is the Pinery, a peculiar, sandy, barren tract of land partly covered by a sparse growth of pines and deciduous underbrush, with, near the Lake, patches of juniper. Lake County has much more woodland, and is more hilly or rolling than Cook County. Extending along the Lake shore, from the northern border of the state nearly the entire length of this county, is a tract quite similar to the Pinery before described, except that here the sand-hills near the Lake are nearly covered with the junipers (*Juniperus communis*). Throughout this county are scattered a large number of small lakes, many of which have a marshy border and are much frequented by waterfowls, both during the migrations and the breeding season.

The woods near Lake Michigan, in both these counties, are upon ridges extending parallel to the Lake shore, which are separated by belts of prairie. These ridges form convenient highways for the woodland species during the migrations. The water birds either follow the Lake shore or the river courses. The migrations of the latter are almost directly north and south, but with the woodland species it is quite different. They follow the heavily wooded river bottoms from the south, and approach the sparsely wooded states along the upper Mississippi in immense numbers, where they swerve toward the heavily wooded region of the northern Lake region, where they find extensive breeding grounds. This change in the direction of their migration causes them to move diagonally across the northern half of Illinois toward the north-east. To this we are indebted for the vast numbers of migrants found along the Lake in this vicinity. Weary from their flight up the Mississippi and Illinois rivers, they halt along the inviting ridges bordering the Lake. After a short rest they resume their northward way, striking boldly across the Lake towards their summer homes in northern Michigan and beyond. I have many times stood upon a wooded bluff on the Lake shore and seen flock after flock of warblers and other small birds pass out of sight over the Lake.

The fall migration is less uniform, the birds straggling along in such a manner that it is difficult to trace any movement except a general inclination to the south. A severe storm upon the Lake during the spring migration works sad havoc among the birds, for when a fog arises they become bewildered and perish by thousands, and large numbers are washed ashore. An instance of this kind occurred the last of May, 1876, when I counted over two hundred birds, representing over fifty species, in walking about a mile along the Lake shore.

For many valuable notes included in the present paper I am indebted

to Dr. P. R. Hoy, of Racine, Wisconsin; to Dr. H. B. Bannister, of Evanston; to Mr. C. N. Holden, Jr., of Chicago; to Mr. F. T. Jencks, of Providence, R. I., who was my companion in the field during the spring of 1876, and who added materially to my notes; and especially to Mr. F. L. Rice of Evanston, who placed at my disposal notes extending over several years. I am also indebted to Messrs. T. H. and C. W. Douglas, of Waukegan, and to others for valuable notes, which are duly acknowledged in the following pages. My own observations have been continued through the last three years, and have been made in various localities in the two above named counties. The dates of the migrations and nesting given indicate the average of observations continued through several years.

Family **TURDIDÆ.**

Genus **Turdus** Linn.

1. **T. mustelinus** *Gmel.* WOOD THRUSH. Common summer resident in suitable places. Arrives first of May; nests the last of the month and leaves September first.

2. **T. fuscescens** *Steph.* WILSON'S THRUSH. Rather rare summer resident. Arrives in small numbers the second week of May and departs the first of September.

3. **T. aliciae** *Bd.* ALICE'S THRUSH. Very abundant migrant; frequenting open woods and the borders of adjacent fields. May 1st to 20th; September 1st to October 5th. I have rarely heard this species sing except during damp, gloomy days in spring, when trees and bushes were dripping with a fine misty rain. On such occasions, I have often been greeted by the clear metallic notes of this thrush rising clear and strong, filling the air with a sweet, indescribable melody, and then dying away in measured cadence until the last notes are scarcely distinguishable. As the first strain ends the song is re-echoed by hidden musicians on every hand, until every tree seemed to give forth the weird music.

4. **T. swainsoni** *Caban.* SWAINSON'S THRUSH. Abundant migrant and a very rare summer resident. Arrives in spring a few days later than the preceding, and at about the same time in fall. I obtained a specimen near Chicago, June 7th, 1873, and July 9th, the same year, Mr. Rice obtained a second specimen. The song of this species is similar, but much less musical, than that of the preceding.

5. **T. pallasi** *Caban.* HERMIT THRUSH. Very abundant migrant. April 1st to May 10th, and September 20th to October 31st. Several years since, during the fall migration, one of these birds was brought to me alive, it having entered a neighbor's house in Chicago, through an open window in which were some very large plants. This,

with the two preceding species, frequent vacant lots and grounds containing shrubbery in Chicago, in large numbers during the migrations.

6. *T. migratorius* Linn. ROBIN. Common summer resident. Arrives March 1st in large flocks. The resident birds commence nesting April 15th, and all leave during October and the first part of November.

Genus *Harporhynchus* Cab.

7. *H. rufus* Linn. BROWN THRUSH. Common summer resident. Arrives April 20th, nests the middle of May, and departs in September. That the nest of this species is often placed in trees and bushes for protection against some apparent danger I have no doubt, but in many cases this site is chosen from a mere whim of the bird. I have found in one "scrub oak" grove, on a sandy ridge, some half dozen nests for several seasons in succession, and each year about one-half the nests were in the trees, and the remainder were built at the bases of saplings or bushes, yet I could find no apparent cause for the location of the nests in the trees. The young were in each case reared with equal safety.

Genus *Mimus* Bote.

8. *M. polyglottus* L. MOCKING BIRD. A very rare summer resident. I know of but few instances of its occurrence in the vicinity of Chicago. Dr. Hoy has recorded six nests obtained in the vicinity of Racine, Wisconsin.

Genus *Galeoscoptes* Caban.

9. *G. carolinensis* L. CAT BIRD. Very common summer resident. Arrives May 1st; nests the middle of this month and departs during September.

Genus *Myiadestes* Cab.

10. *M. townsendi* Aud. TOWNSEND'S THRUSH. A single specimen of this species was obtained December 16, 1875, by Mr. Charles Douglas, at Waukegan. The bird was found in a sheltered ravine, extending a short distance into the bluff, bordering the lake shore near the above named place, and showed no alarm when approached. Nothing peculiar was observed concerning its habits except that its movements were very sprightly.

Family **SAXICOLIDÆ.**

Genus *Sialia* Sw.

11. *S. sialis* Bd. BLUE BIRD. Arrives early in March and is abundant, in flocks, until the first of May, when they commence

breeding. The fall migration extends from September 12th to October 25th. Under the date of October 1st, 1876, my friend Mr. N. S. Davis, Jr., of Evanston, writes that within a few days he has observed several Blue Birds eating the berries of the wild ivy (*Ampelopsis quinquefolia*), growing near that place.

NOTE.—*S. arctica*. Dr. Hoy informs me that he has seen a specimen of this species, in a collection at Dubuque, Iowa, which was taken, late in the fall, upon the east side of the Mississippi River near that town.

Family **SYLVIIDÆ**.

Genus *Regulus* Cuv.

12. *R. satrapa* Licht. GOLDEN-CROWNED KINGLET. Abundant migrant. April 1st to May 10th, and October 1st to 31st.

13. *R. calendula* Licht. RUBY-CROWNED KINGLET. Like the preceding, abundant during the migrations, and found everywhere in woods. Several days behind the other species in the spring and in advance in the fall.

Genus *Polioptila* Sclat.

14. *P. cærulea* Sclat. BLUE-GRAY GNATCATCHER. Common migrant. April 27th to May 20th, and August 25th to September 10th. Owing to a lack of heavy timber, few remain to breed.

Family **PARIDÆ**.

Genus *Lophophanes* Kaup.

15. *L. bicolor* Bonap. TUFTED TITMOUSE. Occurs only during fall and winter, when straggling parties occasionally visit us from Southern Illinois, where it is one of the characteristic species.

Genus *Parus* Linn.

16. *P. atricapillus* Linn. BLACK-CAPPED TITMOUSE. Resident. More numerous during the migrations and in winter.

17. *P. carolinensis* Aud. CAROLINA TITMOUSE. A rare summer visitant to the "Plnery," at the southern end of Lake Michigan.

18. *P. hudsonicus* Forst. HUDSON'S BAY TITMOUSE. A very rare winter visitant. Dr. Hoy observed a small flock near Racine in January, 1852; and Dr. Velle has since observed them at Rock Island, Illinois.

Genus *Sitta* Linn.

19. *S. carolinensis* Lath. WHITE-BELLIED NUTHATCH. Common resident. More abundant during the migrations. Near Wauke-

gan, May 10th, 1876, a pair of these birds were observed carrying material for a nest, into a knot-hole in a large oak, about twenty-five feet from the ground. The hole was large enough to admit my hand, and several inches deep, but filled to within two inches of the top by the remains of an old squirrel's nest. The birds worked steadily for about a week, lining the cavity with small fragments of dry leaves and pieces of rabbits' fur. Just as the nest was finished a pair of flying squirrels took possession of the premises and the birds sought another location.

20. *S. canadensis* Linn. RED-BELLIED NUTHATCH. Rather more numerous early in the migrations than the preceding. April 1st to May 10th, and August 25th to October 30th. A rare summer resident. I found a pair near Chicago with full grown young the first of July, and Mr. Rice observed a pair feeding unfledged young the last of April, 1874, at Evanston. The excavation containing this nest was in a tree, standing on one of the principal streets of the town. It was about twenty feet from the ground. The young were thrusting their heads out of the hole and clamoring for food, thus attracting his attention when they would otherwise have been unnoticed.

Family **CERTHIIDÆ.**

Genus *Certhia* Linn.

21. *C. familiaris* var. *americana* Bonap. BROWN CREEPER. Common winter resident, arriving October 1st and remaining until May 10th. Particularly abundant the first two weeks of October and of April, when they frequent the streets of Chicago in large numbers, industriously searching the rough brick walls for the small spiders which they find in abundance in the numerous crevices. I have seen as many as a dozen of these birds upon the side of a house at once, moving from place to place as readily as though on the trunk of a tree.

Family **TROGLODYTIDÆ.**

Genus *Thryothorus* Vieill.

22. *T. ludovicianus* Bonap. GREAT CAROLINA WREN. A rare summer visitant. Abundant in Southern Illinois.

23. *T. bewicki* Bonap. BEWICK'S WREN. Rare summer resident. A pair of these birds appeared in a vacant lot in Chicago the first of June, 1876, and taking possession of a convenient corner in the roof of an arbor proceeded to raise their young. At intervals through the day the male would mount to the top of some house, or the topmost twig of a tree in the vicinity, and sing for an hour or more. The family suddenly left about the middle of July.

Genus *Troglodytes* Vieill.

24. *T. ædon* Vieill. HOUSE WREN. Rather common summer resident away from the immediate vicinity of the Lake. Arrives the first of May and departs the last of September.

25. *T. parvulus* var. *hyemalis* Vieill. WINTER WREN. A common migrant. April 5th to May 1st, and September 12th to October 20th. I have found this species much more musical during the fall migration than in the spring.

Genus *Cistothorus* Caban.

26. *C. stellaris* Caban. SHORT-BILLED MARSH WREN. Rather common summer resident and generally distributed in suitable places. Breeds last of May. I think the distribution of this species is much more general than is supposed. Owing to the character of the locality in which they are found, and to their shyness, the chances are that they will be overlooked. Before I learned their habits I passed repeatedly through places where I afterwards found they were quite common.

27. *C. palustris* Bd. LONG-BILLED MARSH WREN. Abundant summer resident in marshy localities. Arrives the first of May, nests the last of this month to the first of August. I have seen hundreds of the nests of this species but have yet to see one attached to a bush in the manner described in Baird, Brewer and Ridgway's "North American Birds" (Vol. I, p. 162). The nests I have seen have almost invariably been placed in the midst of tall bulrushes, or wild rice, growing upon a more or less submerged marsh, and are supported about two feet above the surface, by being firmly attached to several of the surrounding stalks, something in the manner of the attachment of the Red-winged Blackbird's nest. The structure of the nests agrees with the description in the above named work, with the exception of mud never being used in nests I have examined. While the female is incubating, the male is almost constantly employed upon the construction of several unfinished nests, until often a pair may boast the possession of a dozen unoccupied tenements. The supernumerary nests are less substantial structures than the one occupied, and are built indifferently of the living or dead grass leaves, the latter being almost exclusively used in the structure occupied.

Family MOTACILLIDÆ.

Genus *Anthus* Bechst.

28. *A. ludovicianus* Licht. TITLARK. Common in flocks along the Lake shore and on bare prairies during the migrations. Arrives about the 15th of May. It is then just assuming the breeding dress,

and remains until about the 30th, when, its moult being completed, it moves north. Returns in October.

Family **SYLVICOLIDÆ.**

Genus **Mniotilta** Vieill.

29. M. varia Vieill. BLACK AND WHITE CREEPER. Not an uncommon summer resident. Abundant in the migrations; April 25th to May 15th, and August 20th to October 10th.

Genus **Protonotaria** Bd.

30. P. citrea Bd. PROTHONOTARY WARBLER. A rare summer visitant. Two specimens were taken during the summer of 1875, and I have heard of several other instances of its occurrence. All the specimens taken in this vicinity have remarkably dull colored plumage.

Genus **Helmitherus** Raf.

31. H. vermivorus Bonap. WORM-EATING WARBLER. Very rare visitant. A single specimen observed May 21st, 1876, at Waukegan.

Genus **Helminthophaga** Caban.

32. H. chrysoptera Caban. GOLDEN-WINGED WARBLER. Comparatively rare. It breeds rarely. Migrates May 15th to 25th, and September 1st to 20th.

33. H. ruficapilla Bd. NASHVILLE WARBLER. A rare summer resident. Very common during migrations; May 10th to 24th, and September 5th to 30th, and perhaps later.

34. H. celata Bd. ORANGE-CROWNED WARBLER. A common migrant; April 27th to May 20th, and September 15th to October 25th. Frequents bushy hillsides and borders of woods.

35. H. peregrina Caban. TENNESSEE WARBLER. Nearly equal to the preceding in numbers, but more difficult to procure during the spring migration, owing to its frequenting the tops of the trees and moving quickly from place to place. Like several other species of warblers which frequent the tops of the trees in spring, it is found much lower in fall, when it may be easily obtained. I have found this true of adults and young of the year. Migrates May 15th to 25th, and August 25th to October 10th.

Genus **Parula** Bonap.

36. P. americana Bonap. BLUE-YELLOW-BACKED WARBLER. An abundant migrant from May 8th to 25th, and August 25th to September 20th. Breeds rarely.

Genus *Perissoglossa* Bd.

37. *P. tigrina* Bd. CAPR MAY WARBLER. Very common migrant. May 7th to 25th, and September 5th to 20th. In spring, found almost exclusively in the tops of the trees; in autumn found in large numbers along roadsides, borders of woods and fields in company with *Dendroica palmarum*, from which it is, with difficulty, distinguished at gunshot, so closely alike are their habits and movements at this season.

Genus *Dendroica* Gray.

38. *D. aestiva* Bd. YELLOW WARBLER. Abundant summer resident. Arrives May first and departs the last of August and first of September.

39. *D. coronata* Gray. YELLOW-RUMPED WARBLER. An exceedingly abundant migrant; April 1st to May 24th, and September 20th to October 25th.

40. *D. maculosa* Bd. BLACK AND YELLOW WARBLER. Nearly as numerous in the migrations as the preceding. May 8th to 29th, and August 25th to October 10th.

41. *D. caerules* Bd. CERULEAN WARBLER. A regular but rare migrant. May 12th to 20th, and the first of September. Prefers high woods. Very abundant in the southern half of the state. Rare summer resident here, but near Detroit, Michigan, I am informed it is one of the common species at this season.

42. *D. blackburniæ* Bd. BLACKBURNIAN WARBLER. Very abundant during the migrations. May 10th to June 3rd, September 7th to 25th. One of our commonest species during the migrations. The males arrive at least a week in advance of the females.

43. *D. dominica* var. *albilora* Bd. YELLOW-THROATED GRAY WARBLER. A very rare summer visitant from the south. Prof. D. S. Jordan of Indianapolis, Indiana, informs me that this species is a common summer resident in that vicinity, and I have trustworthy information of its rather common occurrence, in summer, in the vicinity of Detroit, Michigan.

44. *D. pennsylvanica* Bd. CHESTNUT-SIDED WARBLER. Abundant migrant; May 1st to 25th; September 1st to 20th. Breeds sparingly away from the Lake.

45. *D. striata* Bd. BLACK-POLL WARBLER. A common migrant; May 15th to 28th, and September 12th to October 1st.

46. *D. castanea* Bd. BAY-BREASTED WARBLER. Abundant migrant; May 8th to 25th. In autumn this species, with the preceding, is found in large numbers everywhere, except upon the open prairies.

47. *D. caerulescens* Bd. BLACK-THROATED BLUE WARBLER. A common migrant; May 12th to 25th, and September 10th to October 20th.

48. *D. virens* Bd. BLACK-THROATED GREEN WARBLER. Very common migrant; May 5th to 25th, September 20th to October 12th. A few remain to breed.

49. *D. pinus* Bd. PINE-CREEPING WARBLER. Common migrant; April 27th to May 20th, September 15th to October 5th. The first of July, 1874, I found a large number of these birds with young just old enough to follow their parents, in the "Pinery," and presume they nest there regularly.

50. *D. palmarum* Bd. YELLOW RED-POLL WARBLER. An abundant migrant; April 25th to May 20th, and September 10th to October 15th.

51. *D. discolor* Bd. PRAIRIE WARBLER. A very rare spring and summer visitant, perhaps breeding. But very few specimens have been taken in the vicinity of Chicago. Dr. Hoy writes that he knows of but one instance of its capture in Wisconsin.

Genus *Siurus* Sw.

52. *S. aurocapillus* Sw. GOLDEN-CROWNED WAGTAIL. An abundant migrant; from May 5th to 20th, September 15th to October 20th. Common resident in all suitable places.

53. *S. noveboracensis* Nutt. WATER WAGTAIL. An abundant migrant; April 1st to May 10th, and August 25th to October 25th. Found anywhere in damp woods or along the banks of streams during the migrations. A very few remain to breed in secluded woods.

54. *S. ludovicianus* Bonap. LARGE-BILLED WATER WAGTAIL. Not an uncommon summer resident, arriving May 8th to 15th, and leaving the first of September. Much more striking in its habits than the preceding, and prefers dark woods or dense willow patches in wet situations.

Genus *Oporornis* Bd.

55. *O. agilis* Bd. CONNECTICUT WARBLER. A rather common migrant; May 15th to 27th, and September first to October first. The species occurs in about equal numbers in spring and fall. Near Waukegan, the last of May, 1876, these birds were found frequenting a dense swampy thicket on the border of a wood, in company with *Geothlypis philadelphia* and two species of *Siurus*. They kept close to the ground and were quite difficult to shoot, as they would dart into the thicket upon the slightest alarm. Their habits in this locality were so nearly like those of *G. philadelphia*, that, until actually in hand, it was not an easy matter to distinguish them. While confined to the house by illness, the 26th and 27th of May, Mr. Jencks had the pleasure of becoming still better acquainted with their habits. His attention was first drawn to them by hearing a loud ringing song en-

tirely new to him. Going to the door he saw the author of the song, upon one of the lower branches of a small pine tree close to the house. The specimen was soon in his possession and proved to be this species. Afterwards, during this and the following day, he heard the song repeatedly, and obtained other specimens of the bird. Their note he describes as being a trifle harsh, but pleasant to the ear. It is delivered with force, in a clear ringing manner, slightly resembling that of *G. trichas*. Their habits and movements while about the pine trees — within twenty yards of the house — closely resembled those of *S. aurocapillus*, with which they were associated.

56. *O. formosus* Bd. KENTUCKY WARBLER. A very rare summer visitant from Southern Illinois.

Genus *Geothlypis* Caban.

57. *G. trichas* Caban. MARYLAND YELLOW-THROAT. An abundant resident. Arrives May 8th; departs first of September. Breeds June first.

58. *G. philadelphia* Bd. MOURNING WARBLER. Not common. Migratory. Found in swampy thickets May 15th to 31st, and the first of September.

Genus *Icteria* Vieill.

59. *I. virens* Bd. YELLOW-BREASTED CHAT. A regular but not common summer resident. Arrives May 1st to 10th, and leaves the last of August. Nests in hazel thickets.

Genus *Myiodioides* Aud.

60. *M. mitratus* Aud. HOODED WARBLER. A rare summer resident; arriving May 10th to 20th, and leaving early in autumn.

61. *M. pusillus* Bonap. GREEN BLACK-CAPPED WARBLER. A common migrant; May 7th to 25th, and the first of September. Found along the borders of woods and about willow patches.

62. *M. canadensis* Aud. CANADA WARBLER. A common migrant; May 15th to 29th, and the first of September. Rare summer resident.

Genus *Setophaga* Swains.

63. *S. ruticilla* Swains. REDSTART. An abundant migrant; May 10th to 25th, and in September. Also a Common summer resident in damp woods.

Family **HIRUNDINIDÆ.**

Genus *Progne* Boie.

64. *P. subis* Bd. PURPLE MARTIN. A very common summer

resident in towns. Arrives April 10th to 30th; departs the first of September.

Genus *Petrochelidon* *Caban.*

65. *P. lunifrons* *Bd.* CLIFF SWALLOW. An abundant migrant; May 1st to 10th, and the first of September. Also a common summer resident.

Genus *Hirundo* *Linn.*

66. *H. horreorum* *Bart.* BARN SWALLOW. A very common summer resident; arrives April 15th to May 10th; departs the first of September.

67. *H. bicolor* *Vieill.* WHITE-BELLIED SWALLOW. Common resident. Arrives in large numbers March 20th. The first of May only residents remain. Departs in September. This species still keeps its primitive habit of nesting in deserted woodpecker's holes, hollow stumps and similar places, generally close to some stream or body of water. Several times during the spring I have seen these birds occupy martin houses for several weeks until the owners returned, when, after a desperate battle they would leave. Have never observed them about the town during the breeding season.

Genus *Stelgidopteryx* *Bd.*

68. *S. serripennis* *Baird.* ROUGH-WINGED SWALLOW. A rare summer visitant, perhaps breeds.

Genus *Cotyle* *Boie.*

69. *C. riparia* *Boie.* BANK SWALLOW. Abundant summer resident. Arrives May 7th; departs September first. Nests in the sand-hills and clay bluffs along the Lake shore.

Family **VIREONIDÆ.**

Genus *Vireo* *Vieill.*

70. *V. olivaceus* *Bonap.* RED-EYED VIREO. Common summer resident. Arrives May 15th and departs the last of September and first of October. I have found the irides, indifferently, red or brown, in spring specimens of this species.

71. *V. philadelphicus* *Cass.* PHILADELPHIA VIREO. A common migrant; May 15th to 25th, and September 5th to 25th. While passing in the spring these birds frequent either willow thickets or high woods. They were so numerous near Waukegan about the 20th of May, 1876, that a dozen specimens might have been obtained in an hour. The first of July, 1874, I found two pairs of these birds in a

dense willow thicket bordering Mazon Creek, about sixty miles south of Chicago. Upon my approach the birds showed great anxiety, uttering a short complaining cry, and coming within a few feet of me. That they had young in the vicinity I was sure, but owing to the character of the covert they were not found. Specimens of this species may invariably—as far as my experience goes—be separated from those of *V. gilvus* by the greater intensity of yellow on the former, as well as by the quill characters.

72. *V. gilvus* Cass. WARBLING VIREO. A common summer resident. Arrives May 8th to 15th; departs in September.

73. *V. solitarius* Bd. BLUE-HEADED VIREO. An abundant migrant; May 5th to 25th, and the last of September and first of October. Found everywhere in the woods and thickets.

74. *V. flavifrons* Bd. YELLOW-THROATED VIREO. A common migrant and not uncommon summer resident. May 8th to 24th, and September 10th to October 15th.

75. *V. noveboracensis* Bonap. WHITE-EYED VIREO. Summer resident. Rather rare. Arrives the middle of May and departs the first of October. Very common in Southern Illinois.

76. *V. belli* Aud. BELL'S VIREO. A single specimen, obtained near Chicago, June 23, 1875, is the only instance I have recorded of its occurrence in this vicinity. It is a common summer resident on the more southern prairies of the state.

Family **AMPELIDÆ.**

Genus ***Ampelis* Linn.**

77. *A. garrulus* Linn. BOHEMIAN WAXWING. An irregular but occasionally abundant winter resident, especially along the lake. Arrives in December and sometimes remains until April. The winter of 1875-6 they were unusually numerous. In a letter dated March 16, 1876, Mr. Charles Douglas, of Waukegan, describes an "immense" flock of these birds which he observed the day previous, upon the lake shore near that town. The birds were feeding upon the juniper berries found there, and covered, according to Mr. Douglas's estimation, an area at least ten rods square. While feeding, those in the rear were continually flying and alighting in advance, thus keeping the flock moving so that it was difficult to overtake them. A few days later the flock separated into numerous smaller ones and soon departed for the north.

78. *A. cedrorum* Scf. CEDAR BIRD. Common summer resident. Arrives the last of February, breeds from the first of June until the middle of July; leave late in autumn.

Family **LANIIDÆ.**Genus *Collurio* *Vigors.*

79. *C. borealis* *Bd.* GREAT NORTHERN SHRIKE. Regular winter resident. Arrives the last of October and generally departs the last of March. Sometimes they remain late in the season and may breed.

80. *C. ludovicianus* *var. ludovicianus* *Linn.* LOGGERHEAD SHRIKE. Common summer resident throughout the state. I have obtained its nest with a full set of eggs early in April, near Chicago. It generally arrives about the middle of March.

A small series of shrikes from the northern and southern extremes of the state have been submitted to my friend, Mr. J. A. Allen, who replies as follows: "They all belong decidedly to *var. ludovicianus*, though somewhat lighter than Florida specimens, with smaller bills, etc. There is a slight approach in some of them to *excubitoroides*, but the resemblance to Florida specimens is far greater than to specimens from the West—Wyoming, Utah, Colorado, etc." During the past two years I have examined a large number of shrikes from northern Illinois, and have found them, in nearly all cases, to be much nearer *ludovicianus* than *excubitoroides*. Specimens obtained in the Wabash Valley and other parts of Southern Illinois, exhibit the same characteristics in about equal proportion, as far as the number of specimens seen would permit me to judge.

80a. *Var. excubitoroides* also occurs throughout the state, especially upon the prairies, but is much less numerous than the eastern form. Their habits are identical.

Family **TANAGRIDÆ.**Genus *Pyranga.*

81. *P. rubra* *Vieill.* SCARLET TANAGER. Common summer resident. Arrives May 8th and leaves early in autumn.

82. *P. æstiva* *Vieill.* SUMMER RED-BIRD. A rare summer visitant. I know of but few instances of its occurrence.

Family **FRINGILLIDÆ.**Genus *Hesperiphona* *Bonap.*

83. *H. vespertina* *Bonap.* EVENING GROSBEAK. A winter visitant occurring at irregular intervals. The winter of 1871 they were quite common throughout the northern portion of the state. The following winter they were much rarer, and since then but very few have been seen. I am told that formerly, it was of much more regular occurrence.

Genus *Pinicola* Vieill.

84. *P. enucleator* Cab. PINE GROSBILL. Formerly common; now a rare winter visitant.

Genus *Carpodacus* Kaup.

85. *C. purpureus* Gray. PURPLE FINCH. Common winter resident; a few breed. Arrives from the north in flocks the last of October, and remains until April.

Genus *Chrysomitris* Boie.

86. *C. tristis* Bonap. GOLDFINCH. Common resident. The winter dress is assumed the last of October and retained until the first of May.

87. *C. pinus* Bonap. PINE FINCH. A common winter resident associating with the preceding. Arrives the last of October and departs the last of May. Prof. Jordan informs me that he has taken a specimen near Indianapolis in midsummer.

Genus *Loxia* Linn.

88. *L. curvirostra* var. *americana* Bd. RED CROSSBILL. Formerly a common winter resident; now rare.

89. *L. leucoptera* Gmel. WHITE-WINGED CROSSBILL. Like the preceding, a winter resident of rare occurrence at present.

Genus *Ægiothus* Caban.

90. *Æ. linarius* Caban. LESSER RED-POLL. An abundant winter resident. Arrives in flocks the last of October, and remains until the last of March.

91. *Æ. canescens* Caban. MEALY RED-POLL. A rare winter visitant with the preceding.

Genus *Plectrophanes* Meyer.

92. *P. nivalis* Meyer. SNOW BUNTING. An abundant winter resident. Arrives in flocks the first of November and remains until about the middle of March. The 5th of March, 1875, I saw a flock of these birds in a tree in Chicago. The males were chanting a very low, and somewhat broken, but very pleasant song, bearing considerable resemblance to that of *Spizella monticola*. This and the following species, as well as other winter residents, appear a week or more earlier in the fall and depart later in spring, in the vicinity of the Lake than in other parts of the state in the same latitude.

93. *P. lapponicus* Selby. LAPLAND LONGSPUR. A very abundant winter resident in the prairie districts of the state. Arrives in

straggling flocks from October 1st to 10th, and remains until the first of May. During the last of March and first of April, large straggling flocks pass north. An unusually large flight took place the 20th of March, 1873. A continuous series of large flocks occupied over two hours in passing. Those remaining after the middle of April are in breeding plumage.

94. *P. pictus* Swains. PAINTED LONGSPUR. Common migrant. March 30th, 1875, near Calumet Lake, I found a flock containing about seventy-five individuals of this species. Their habits were quite similar to those of *P. lapponicus* while upon the ground, except that while the latter species preferred the wet portions of the prairie, the former were found only about the higher portions. When flushed they invariably uttered a sharp clicking note, rapidly repeated several times. When driven from their feeding-place by my approach, they would rise, in a loose flock, and after wheeling about a few times start off in a direct line, gradually rising higher until they disappeared. After a short time their peculiar note would be heard, and darting down from a considerable height they would alight near the place from which they were driven. Although the flocks of *P. pictus* and *P. lapponicus* often became mingled while flying over the prairie, I did not see them alight together.

Genus *Pyrgita* Cutler.

95. *P. domestica* Cuv. HOUSE SPARROW. Introduced into Chicago a few years since and has become very numerous throughout the city.

Genus *Passerculus* Bonap.

96. *P. savanna* Bonap. SAVANNA SPARROW. Plentiful during migrations, from April 1st to May 20th, and September 15th to October 25th. Not an uncommon summer resident.

Genus *Poocætes* Bd.

97. *P. gramineus* Bd GRASS FINCH. Abundant summer resident. Arrives March 25th to April 10th, and departs the last of September. Large numbers nest on the ground among the junipers and other low bushes along the Lake shore.

Genus *Ammodromus* Ste.

98. *A. henslowi* Bonap. HENSLOW'S BUNTING. Rather common summer resident upon the prairies. Arrives May 12th to 20th, and leaves the first of September. A very inconspicuous species that may be easily overlooked. Has a peculiar, weak, squeaky song, consisting of several short notes. Nests the last of May.

99. *A. lecontei* Bonap. LECONTE'S BUNTING. A rare migrant.

I obtained a fine specimen May 18th, 1875, at Riverdale, Illinois, and by my notes I see that a second specimen was observed the 21st of the same month near where the first was obtained. The specimen in my possession was flushed from a small depression in the prairie near the Calumet river, where the moisture had caused an early growth of coarse grass, about three inches in height. After darting off in an erratic course a few rods, it suddenly turned, and alighting ran rapidly through the grass, from which it was with difficulty started again and secured.

100. *A. passerinus* Bonap. YELLOW-WINGED SPARROW. One of our most abundant summer residents. Found everywhere in fields and on prairies, from the middle of May until first of September.

101. *A. caudacutus* var. *nelsoni* Allen. NELSON'S SHARP-TAILED FINCH. First obtained September 17th, 1874, in the Calumet Marsh, where it was abundant at the time. The 12th of June, 1875, I saw several of these birds in the dense grass bordering Calumet Lake, where they were undoubtedly breeding. The first of October, 1875, I again found them abundant on the Calumet Marsh, and also found them numerous in the wild rice bordering Grass Lake, Lake County, Illinois, the 10th of November the same year. Prof. S. A. Forbes has taken them on the Illinois River during the migrations, and Dr. Hoy has obtained a single specimen at Racine. From the numbers which visit us in fall, they must breed in abundance north of this state. They are difficult to obtain as they take refuge in the dense marsh grass upon the first alarm. Occasionally one mounts a tall reed and utters a short unmusical song, slightly resembling that of the Swamp Sparrow (*M. palustris*).

Genus *Chondestes* Sw.

102. *C. grammacus* Bonap. LARK FINCH. A common summer resident. Arrives the last of April or first of May, nesting the last of this month; departs August 25th to September 10th. Frequents barren fields and borders of prairies containing a sparse growth of small trees and rank weeds. Its nest is generally placed at the foot of some rank weed in a bare piece of ground. My observations regarding the song and general habits of the species, coincide with those of Mr. Ridgway as given in *North American Birds* (Vol. I, p. 564).

Genus *Zonotrichia* Sw.

103. *Z. leucophrys* Sw. WHITE-CROWNED SPARROW. Common migrant: March 20th to May 15th, and September 20th to October 25th. Frequents borders of cultivated fields and hedges.

103a. Var. *intermedia* Ridg. The 20th of April, 1871, a specimen of this form was obtained near Racine by Dr. Hoy. The specimen

has been kindly loaned me for examination, and is without doubt a perfectly authentic example of this variety. The lores are almost white, considerably lighter than in average specimens of *intermedia*.

104. *Z. coronata* Bd. GOLDEN-CROWNED SPARROW. A beautiful male specimen of this species was obtained the middle of April, 1858, by Dr. Hoy in his garden at Racine. The specimen was first identified by Mr. Cassin. This specimen was loaned me with the preceding, and upon comparison I find it differs but very slightly from California specimens of the same species in my collection.

105. *Z. albicollis* Bonap. WHITE-THROATED SPARROW. Very abundant migrant, and rare summer resident. Migrates April 20th to May 25th, and September 20th to October 30th.

106. *Z. querula* Gamb. HARRIS'S FINCH. A very rare visitant. There is a specimen in Dr. Hoy's collection, taken at Racine, May, 1856.

Genus *Junco* Wagl.

107. *J. hyemalis* Sclat. SNOW BIRD. Found everywhere in town and country, in the greatest abundance during the migrations; March 15th to May 5th and September 15th to October 30th. A few remain during winter.

Genus *Spizella* Bonap.

108. *S. monticola* Bd. TREE SPARROW. Abundant winter resident about thickets and in marshes. Arrives the 15th of October and departs the 1st of April. The first of March they collect in large flocks and are very musical. Often a large portion of the flock will unite in song which, although it may be more than equalled later in the season, yet, coming as it does between winter and spring, and so touchingly plaintive, one involuntarily stops to listen with a peculiar feeling of pleasure.

109. *S. pusilla* Bonap. FIELD SPARROW. Common summer resident. Arrives April 15th to May 1st, and leaves the last of September. Nests in large numbers in low bushes along the lake shore.

110. *S. socialis* Bonap. CHIPPING SPARROW. A common, but not abundant, summer resident. Arrives the first of April and leaves during October. Mr. Rice has obtained a nest of this species placed in a bunch of grass upon the ground, and in May, 1873, I found a nest placed directly upon the ground at the foot of a coarse weed. In each case the nest contained eggs and the parents were seen.

111. *S. pallida* Bonap. CLAY-COLORED SPARROW. A rare summer resident about the borders of prairies. Specimens are in Mr. Holden's collection taken near Chicago.

Genus *Melospiza* *Bd.*

112. *M. melodia* *Bd.* SONG SPARROW. A common summer resident, but, like the Chipping Sparrow, is far less numerous than in the Atlantic states in the same latitude. Arrives early in March, nests in May and departs in October.

113. *M. lincolni* *Bd.* LINCOLN'S FINCH. Common during the migrations from May 8th to 20th and September 20th to October 15th. Have seen several specimens during the breeding season, and the last of May, 1875, as I was walking through a patch of weeds, a female started from a few feet in advance of me, while my attention was attracted in another direction, and ran off with half-spread wings. It was shot and showed unmistakable signs of incubation, but a protracted search failed to reveal the nest. Specimens were taken in July, 1875, near Waukegan, by Mr. Rice.

114. *M. palustris* *Bd.* SWAMP SPARROW. An abundant summer resident, far outnumbering *M. melodia*, although to one who has not frequently visited its favorite marshes at all seasons, this would seem improbable. Arrives the last of March and departs the last of October.

Genus *Passerella* *Sw.*

115. *P. iliaca* *Sw.* FOX-COLORED SPARROW. Common in the migrations from March 15th to the 1st of May, and September 25th to November 12th. Frequents damp woods and thickets.

Genus *Euspiza* *Bonap.*

116. *E. americana* *Bonap.* BLACK-THROATED BUNTING. A common, and in some localities an abundant, summer resident. Arrives the second week of May and nests during June. Departs during August. Shows a decided preference for orchards and fields grown up with tall weeds. In orchards the nests are generally built in the shoots growing about the base of the trees, and placed about six inches from the ground. In fields I have sometimes found them placed in a depression in the ground. The nests are occasionally visited by Cow-buntings, but whether the strange egg is incubated or not I have not learned.

Genus *Hedymeles* *Cab.*

117. *H. ludovicianus* *Sw.* ROSE-BREASTED GROSBREAK. Rather common summer resident. Arrives 8th to 20th of May, and leaves early in autumn.

Genus *Cyanospiza* *Bd.*

118. *C. cyanea* *Bd.* INDIGO BIRD. Common summer resident. Arrives May 8th to 20th in small flocks, and leaves the last of September and first of October.

Genus *Cardinalis* Bonap.

119. *C. virginianus* Bonap. CARDINAL GROSBILL. A rare and irregular summer resident. Occasionally specimens remain until late in autumn.

Genus *Pipilo* Vieill.

120. *P. erythrophthalmus* Vieill. TOWHEE. Common summer resident. Arrives March 25th to April 15th; departs the last of October.¹

Family ALAUDIDÆ.

Genus *Eremophila* Boie.

121. *E. alpestris* Boie. SHORE LARK. The history of this species in Illinois is somewhat complex. Two current and readily distinguishable varieties are found during the winter, one of which is also found in summer. Aware of their identity, yet wishing confirmation, I sent Mr. Ridgway specimens of the two. The winter resident he pronounced typical var. *alpestris*, and the permanently resident form var. *leucolæma* Cs.

121a. Var. *alpestris* arrives in large numbers with the Longspurs in October and disperses over the prairies, where its habits are essentially the same as those of *leucolæma*, with which it associates to a certain extent. During April it again unites with the Longspurs, and the last of the month departs for its more northern breeding grounds.

121b. Var. *leucolæma* Cs. is a permanent resident, found in equal numbers throughout the year. Sometimes the last of February and regularly during March and April the first set of eggs are deposited, and early in May the fully fledged young commence to appear. After a short rest the female hands the guidance of the young over to the male and resumes her work on a second set of eggs. When the second brood are able to follow, the party wanders wherever inclination leads through the fall and winter, until the breeding season again approaches, when they disband.

A remarkable characteristic of the young of *leucolæma* from Illinois is that they are exactly like the young of *alpestris*, although the young of the two varieties are, usually, even more distinct than the adults. So closely like the young of *alpestris* are they, that Mr. Ridgway had labelled young specimens from this vicinity, and from Southern Illinois, "*alpestris*," and supposed this to be the resident variety until he received the adults above mentioned.

¹ Through Dr. Hoy I learn that two specimens of *P. arcticus* have been taken in Wisconsin, one near Milwaukee, where it is now preserved, and a second opposite Dubuque, Iowa. He has seen both specimens and is positive of their identity.

Family **ICTERIDÆ.**Genus **Dolichonyx** Sw.

122. D. oryzivorus Sw. BOB-O-LINK. Abundant summer resident. Arrives the last of April and leaves the middle of August.

Genus **Molothrus** Sw.

123. M. pecoris Sw. COW BUNTING. Common summer resident. Arrives the last of March and leaves in October.

Genus **Agelæus** Vieill.

124. A. phœniceus Vieill. RED-WINGED BLACKBIRD. An excessively abundant summer resident. Arrives the middle of March and leaves late in fall. During October and part of November this species, in company with the Purple Grackle, forage among cornfields during the day, and at night enter the large marshes to roost in myriads.

Genus **Xanthocephalus** Bonap.

125. X. icterocephalus Bd. YELLOW-HEADED BLACKBIRD. Very common summer resident in large marshes. Arrives the first of May. Commences nesting the last of this month. Owing to the restricted localities inhabited by this bird, it is very slightly known among farmers; even those living next the marshes generally think it an uncommon bird. My observations regarding the actions of the males during incubation do not agree with those of Dr. Coues (Birds of the North-west, p. 190). The only difference between the habits of male and female is the slightly additional shyness of the former. Their nests vary endlessly in size, from four to twelve inches in depth, although the latter size is rather uncommon.

Genus **Sturnella** Vieill.

126. S. magna Sw. MEADOW LARK. Abundant summer resident. Arrives the first of March and leaves the last of October. In mild winters a few are resident.

126a. S. magna var. *neglecta* Aud. WESTERN LARK. A regular but rather rare summer resident upon prairies. A more frequent visitor during the migrations. A fine specimen is in the collection of my friend Mr. A. W. Brayton, taken near Chicago the last of May, 1876. This form is probably a common summer resident upon the prairies in the western portion of the state.

Genus **Icterus** Briss.

127. I. spurius Bonap. ORCHARD ORIOLE. Rather common summer resident. Arrives May 12th, leaves early in autumn.

128. *I. baltimore* Daud. BALTIMORE ORIOLE. Common summer resident. Arrives May 8th and departs in September.

Genus *Scolecophagus* Sw.

129. *S. ferrugineus* Sw. RUSTY BLACKBIRD. Very common in spring and fall, from March 25th to May 1st, and from September until the middle of November. Frequents borders of streams and ponds in large numbers.

130. *S. cyanocephalus* Cab. BREWER'S BLACKBIRD. A very rare visitant in company with the preceding.

Genus *Quiscalus* Vieill.

131. *Q. pupureus* var. *æneus* Ridg. PURPLE GRACKLE. A common summer resident. Arrives the middle of March, and departs late in autumn.

Family CORVIDÆ.

Genus *Corvus* Linn.

132. *C. corax* var. *carnivorus* Bartr. RAVEN. Formerly a not uncommon resident; now occurs only in winter and is rare. Frequents the sand hills along the Lake shore from the last of October until spring. The first of November, 1875, I saw several specimens near Waukegan, where they were repeatedly seen flying along the Lake shore, and also eating the dead fish found there.

133. *C. americanus* Aud. CROW. Resident. This is far from an abundant species in Northern Illinois, at any season or locality. A small number breed in the low pines on the sand hills along the Lake shore, and in winter they unite in small flocks and move from place to place.

Genus *Pica* Cuv.

134. *P. caudata* var. *hudsonicus* Bonap. MAGPIE. "Not uncommon in winter." (Kennicott.) I have no record of its occurrence other than the above, and its capture many years since near Racine, Wisconsin, by Dr. Hoy.

Genus *Cyanura* Sw.

135. *C. cristata* Sw. BLUE JAY. Very common resident. Have taken its eggs the 25th of April. At a farm-house near Waukegan, where I passed the spring of 1876, these birds were protected, and in consequence were very familiar. Some six or eight nests were built in the small pine trees within a few yards of the house, one of which was composed almost entirely of fragments of cloth, strings, and

other soft material found in the yard, scarcely a stick being used in the entire structure. Mr. Rice informs me that a few years since they nested abundantly in the shrubbery in Evanston, but within a few years they have resumed their primitive habits and nest in the woods away from the town.

Genus *Perisoreus* Bonap.

136. *P. canadensis* Bonap. CANADA JAY. Before the pine forest extending along the Lake shore, in the northern extreme of the state, was destroyed, this species was in all probability a regular winter visitant. Dr. Hoy obtained specimens near Racine in the winter of 1859.

Family TYRANNIDÆ.

Genus *Tyrannus* Cuv.

137. *T. carolinensis* Bd. KING BIRD. A common summer resident. Arrives the first of May and departs early in autumn. In the summer of 1875, Mr. Rice saw one of these birds plunge repeatedly into a stream in the manner of a Kingfisher. Shooting the specimen he found its stomach contained aquatic insects.

Genus *Myiarchus* Cab.

138. *M. orinitus* Cab. GREAT-CHESTED FLYCATCHER. Rather common summer resident. Arrives the middle of May and departs in September.

Genus *Sayornis* Bonap.

139. *S. fuscus* Bd. PEWEE. A common summer resident. Arrives the first of April and departs late in autumn.

140. *S. sayus* Bd. SAY'S PEWEE. Two specimens of this species are registered in the catalogue of birds in the Museum of the Northwestern University, at Evanston, from "West Northfield, Illinois, collected by R. Kennicott." These specimens are not in the collection at present. Dr. Hoy has also taken it in Wisconsin.

Genus *Contopus* Cab.

141. *C. borealis* Bd. OLIVE-SIDED FLYCATCHER. Not an uncommon migrant, from May 15th to 25th, and the last of September and first of October. I have taken one specimen as late as June 2nd. It may breed.

142. *C. virens* Cab. WOOD PEWEE. A very common summer resident. Arrives the middle of May and leaves the last of September.

Genus *Empidonax* Cab.

143. *E. pusillus* var. *trailli* Bd. TRAILL'S FLYCATCHER. An uncommon summer resident. Arrives May 8th and departs in September.

144. *E. minimus* Bd. LEAST FLYCATCHER. Common summer resident. Arrives and departs with *E. trailli*.

145. *E. acadicus* Bd. ACADIAN FLYCATCHER. A rare summer resident. Arrives a little later than the preceding.

146. *E. flaviventris* Bd. YELLOW-BELLIED FLYCATCHER. A common migrant; May 15th to 25th, and September until the 1st of October. The first of July, 1873, I found them quite common in a dense swampy thicket in Northern Indiana, where they had probably nested.

Family Alcedinidæ.

Genus *Ceryle* Boie.

147. *C. alcyon* Boie. KINGFISHER. Common summer resident along streams and ponds. Arrives the last of March and departs the last of November.

Family CAPRIMULGIDÆ.

Genus *Chordeiles* Sw.

148. *C. popetue* Bd. NIGHT HAWK. A common summer resident. Arrives the 10th of May and departs in immense flights, often lasting several hours, the 1st of September.

148a. Var. *henryi* Cass. First obtained in this vicinity by Mr. Rice, near Waukegan, July, 1875. The spring of 1876, I found these birds breeding, with var. *popetue*, in considerable numbers among the sand hills on the Lake shore, near Waukegan. I should judge that the two forms existed in about equal numbers at that place. They are, however, less common in other localities I have visited. Among the specimens examined were individuals that exhibited a perfect intergradation of the two forms. Some specimens would have the white patch on the wings like those in typical *henryi*, while the tail was marked as in *popetue*, and vice versa. Other specimens showed a varying degree of white, on the wings and tail, between the two varieties. In none is the lightness of the back quite so prominent as in specimens from the western plains.

Genus *Antrostomus* Gould.

149. *A. vociferus* Bonap. WHIP-POOR-WILL. Common summer resident. Arrives the last of April and departs in September.

Family **CYPSELIDÆ.**Genus *Chætura* Steph.

150. *C. pelagica* Bd. SWIFT. Common in summer. Arrives the first of May and departs the last of August and first of September.

Family **TROCHILIDÆ.**Genus *Trochilus* Linn.

151. *T. colubris* Linn. RUBY-THROATED HUMMER. Common summer resident. Arrives May 10th to 18th and departs the last of September.

Family **CUCULIDÆ.**Genus *Coccygus* Vieill.

152. *C. americanus* Bonap. YELLOW-BILLED CUCKOO. Rather common summer resident. Arrives the middle of May and departs the first of September.

153. *C. erythrophthalmus* Bon. BLACK-BILLED CUCKOO. Common in summer during the same time as the preceding. Arrives perhaps a few days earlier. The two species are of irregular distribution, and are not generally found together in the breeding season.

Family **PICIDÆ.**Genus *Picus* Linn.

154. *P. villosus* Linn. HAIRY WOODPECKER. Resident. More abundant in winter. Rather uncommon in summer.

155. *P. pubescens* Linn. DOWNY WOODPECKER. Resident. Much more numerous at all seasons than the preceding.

Genus *Picoides* Lac.

156. *P. arcticus* Gray. BLACK-BACKED THREE-TOED WOODPECKER. Rare winter visitant. A specimen was shot from a telegraph pole, in Chicago, a few years since, by Dr. Velle. It is a common species in Northern Wisconsin, and before the pines along the Lake were destroyed was probably a regular winter visitant to this state.

Genus *Sphyrapicus* Bd.

157. *S. varius* Bd. YELLOW-BELLIED WOODPECKER. Very common in the migrations from March 25th to the middle of May, and the middle of September to October 10th. Males in spring often have the white nuchal band tipped with red much as in var. *nuchalis*. In

the collection of Mr. C. N. Holden is a fine specimen obtained at Chicago, which has the red extending over the head and neck much like the distribution of color in *S. ruber*, but of a much lighter shade.

Genus *Hylotomus* Baird.

158. *H. pileatus* Bd. PILKATED WOODPECKER. A rare winter visitant. Two specimens were taken near Chicago during the winter of 1878.

Genus *Centurus* Sw.

159. *C. carolinus* Bon. RED-BELLIED WOODPECKER. A rare summer resident. Not very uncommon during the migrations. Departs the last of October.

Genus *Melanerpes* Sw.

160. *M. erythrocephalus* Sw. RED-HEADED WOODPECKER. The majority of these birds move south the last of September and first of October, returning the last of April. A few, generally young of the year, remain through the winter.

Genus *Colaptes* Sw.

161. *C. auratus* Sw. YELLOW-SHAFTED WOODPECKER. Very common summer resident. Arrives the last of March and in April; departs by the first of October.

Family PSITTACIDÆ.

Genus *Conurus* Kuhl.

162. *C. carolinensis* Kuhl. CAROLINA PARAKEET. Formerly occurred. Specimens were taken in this vicinity by R. Kennicott many years ago, and Dr. H. M. Bannister informs me that he has seen it in this vicinity.

Family STRIGIDÆ.

Genus *Strix* Linn.

163. *S. flammea* var. *pratincola* Bon. BARN OWL. Very rare visitant. A pair were caught in a trap near Chicago some years since by Mr. C. H. Smith.

Genus *Otus* Cuv.

164. *O. vulgaris* var. *wilsonianus* Less. LONG-EARED OWL. Not uncommon. Resident. Remains concealed during the day in willow thickets and in similar situations.

165. *O. brachyotus* Steph. SHORT-EARED OWL. The most abundant species of the family. Arrives from the north in large numbers the first of November and disperses through the state. They are common everywhere, on prairies and marshes, during the winter. Remain concealed in a bunch of grass or reeds until about two o'clock, P.M., when they commence flying low over the ground in search of their prey. When approached, while standing on the ground, they crouch and try to escape observation much in the manner of the Burrowing Owl. They are very harmless and are easily tamed.

Genus *Syrnium* Sav.

166. *S. cinereum* Aud. GREAT GRAY OWL. A very rare winter visitant.

167. *S. nebulosum* Gray. BARRED OWL. Owing to the lack of heavy timber this is a rare species in this vicinity. Only two instances of its capture have come under my observation.

Genus *Nyctale* Brehm.

168. *N. acadica* Bon. ACADIAN OWL. Not an uncommon species. Is of frequent occurrence in Chicago, where, upon some of the most frequented streets in the resident portion of the town, over a dozen specimens have been taken within two years. Whether resident or not I have been unable to determine.

Genus *Scops* Sav.

169. *S. asio* Bonap. MOTTLED OWL. Rather common. Resident. Often strays into Chicago and becomes confused, when they may be captured alive, as has also been the case with several specimens of the preceding species.

Genus *Bubo* Dum.

170. *B. virginianus* Bonap. HORNED OWL. Not common. Resident. Formerly common.

170a. Var. *arcticus* Sw. A rare winter visitant. Have a fine specimen in my collection, taken the last of December, 1874.

171. *Nyctea scandiaca* var. *arctica* Gray. SNOWY OWL. Regular winter resident. More numerous in the vicinity of the Lake. Arrives in November and a few remain as late as the first of May.

Genus *Surnia* Dum.

172. *S. ulula* var. *hudsonica* (Gmelin). HAWK OWL. Rare winter resident. Dr. J. W. Velle tells me that he obtained a specimen in Kane County, Illinois, the first of September, 1869.

Family **FALCONIDÆ.**Genus **Falco** *Auct.*

173. F. communis var. **anatum** *Bonap.* DUCK HAWK. Not uncommon during the migrations. Formerly a rare summer resident.

174. F. lithofalco var. **columbarius** *Linn.* PIGEON HAWK. Abundant migrant, from March 20th to May 1st, and from September 15th to October 5th. Rare summer resident.

175. F. sparverius *Linn.* SPARROW HAWK. Abundant migrant and rather common summer resident. Arrives early in March and departs the last of September and first of October.

Genus **Pandion** *Sav.*

176. P. haliaetus var. **carolinensis** (*Gmel.*). FISH HAWK. Not uncommon during March and April in spring, and during September and October in fall. Some seasons this species is quite numerous, especially along the Lake shore.

Genus **Nauclerus** *Vig.*

177. N. forficatus *Ridg.* SWALLOW-TAILED HAWK. According to Kennicott (Ill. Agl. Rept., 1853-4) this beautiful species was once common in this vicinity, but was rare at the time he wrote. I can testify to its scarcity at present, only two or three instances of its occurrence within the last twenty years having been ascertained.

Dr. Hoy has noted *Ictinia mississippiensis* in Wisconsin, but I have no record of its occurrence in this vicinity, although it may yet be observed here.

Genus **Circus** *Lac.*

178. C. cyaneus var. **hudsonius** (*Linn.*). MARSH HAWK. Common in the marshes and on prairies during the migrations; March 25th to April 15th, and during October and November. Said to breed by Kennicott, but I have never seen a specimen here in the breeding season.

Genus **Nisus**.

179. N. fuscus *Kaup.* SHARP-SHINNED HAWK. Abundant during migrations; September 15th to October 30th, and April 15th to May 10th. A few remain to breed.

180. N. cooperi *Bonap.* COOPER'S HAWK. Common summer resident. Arrives the last of April and departs the last of September or first of October.

Genus **Astur** *Lac.*

181. A. palumbarius var. **atricapillus** (*Wils.*). GOSHAWK.

Formerly a common winter resident; now very rare. Dr. A. L. Marcy, of Evanston, found them quite plentiful during the winter of 1870-71, and obtained specimens. The only time I ever saw the bird alive, was the 3rd of May, 1876, at Waukegan, when a fine adult specimen passed slowly overhead and disappeared toward the north.

Genus *Buteo* Cuv.

182. *B. pennsylvanicus* (Wils.). BROAD-WINGED HAWK. Not uncommon the first of May and during September. A few breed.

183. *B. swainsoni* Bonap. SWAINSON'S HAWK. Of rather rare occurrence in this vicinity. Have only noted it during the migrations. I obtained an immature specimen May 30, 1875, at Riverdale, Ill., and have since seen others. As this species breeds in Southern Illinois it probably also breeds in the northern portions of the State.

184. *B. lineatus* Gmel. RED-SHOULDERED HAWK. Common during the migrations. Mr. R. Kennicott speaks of an immense flight of this species, consisting of thousands, which passed over Chicago, "in October, 1854." The main fall migration of hawks in this vicinity takes place the last of September or first of October, and a statement of the numbers which pass in a single day, to one who has not observed them, would be received with incredulity. Choosing a day when there is a strong south or south-west wind, the hawks commence moving south early in the morning and continue flying the entire day, and so numerous that, taking a stand at a good point, one would have from one to fifty hawks in view, with but very few intermissions, throughout the day. Among these occur all the migrants, but by far the greater number consist of the smaller species.

185. *B. borealis* var. *borealis* (Gmel.). RED-TAILED HAWK. The most common resident among the larger Raptores, and very numerous during the migrations.

185a. Var. *calurus* Cass. BLACK RED-TAIL. In my collection is a fine adult specimen of this variety obtained near Chicago in April, 1873, by my friend Mr. C. H. Smith.

Genus *Archibuteo* Brehm.

186. *A. lagopus* var. *sancti-johannis* (Penn.). Arrives in large numbers the first of October, and after remaining for a few weeks the majority pass further south for the winter. The last of February and first of March they depart for the north. Exceedingly shy except while migrating, and in consequence but few are shot. Mr. C. H. Smith captured alive a fine specimen in the black plumage, in the spring of 1874, and kept it until the early part of summer, when the hot weather caused its death.

For noble presence and piercing eye this bird has few equals among

our Falconidæ. The specimen above mentioned bore a striking resemblance to a Golden Eagle.

Genus *Aquila* *Auct.*

187. *A. chrysaetus* var. *canadensis* Linn. GOLDEN EAGLE. Not very uncommon during winter. Arrives in November and departs early in spring. Formerly nested throughout the state. Dr. Hoy records the breeding of a pair of these birds in a tree near Racine in 1851 (Wis. Ag't Rept., 1852). In December, 1874, while hunting Prairie Chickens in a field a few miles south of Chicago, my friend, Mr. T. Morris, was suddenly attacked with great fury by a pair of these birds, they darting so close that had he been prepared he could easily have touched the first one with his gun. As it arose to renew the attack he fired a small charge of number six shot, and brought it down, dead. The second then darted at him, and so rapidly that he did not fire until it had turned and was soaring up, but so near that the charge passed through the primaries in a body, disabling but not injuring the bird, which was then captured alive. The cause of this attack was explained by the proximity of a carcass upon which these birds had been feeding. The craw of the dead eagle contained a large quantity of carrion, as I learned upon skinning it.

Genus *Haliaetus* *Sav.*

188. *H. leucocephalus* (Linn.). BALD EAGLE. A common winter resident throughout the state, and breeds sparingly. Mr. T. H. Douglas writes me that a pair reared young in the vicinity of Waukegan, in 1873.

Family **CATHARTIDÆ.**

Genus *Rhinogryphus* *Ridg.*

189. *R. aura* (Linn.). TURKEY BUZZARD. A very irregular and rare visitant in this vicinity. Sixty miles south it is a common summer resident, yet I know of but very few instances of its occurrence here. A specimen was captured, after a snow storm, late in autumn, several years since at Waukegan, by Mr. Charles Douglas.

Family **COLUMBIDÆ.**

Genus *Ectopistes* *Sv.*

190. *E. migratoria* Sv. WILD PIGEON. Very abundant migrant; 15th of March to middle of April, and in October and November. Sometimes arrives in February. A few isolated pairs still breed in unfrequented woods.

Genus *Zenædura* Bonap.

191. *Z. carolinensis* Bonap. CAROLINA DOVE. A very common summer resident. The majority arrive the last of March and first of April, and depart by the middle of October. Straggling parties are occasionally observed during the winter. In many places this species becomes semi-domesticated, breeding in the trees in the yard and showing but little fear when approached.

Family **MELEAGRIDÆ.**Genus *Meleagris*.

192. *M. gallopavo* Linn. WILD TURKEY. Formerly plentiful. No specimens have been observed for many years. Still abundant in Southern Illinois and in the bottom-lands along the rivers in Central Illinois.

Family **TETRAONIDÆ.**Genus *Pedicecetes* Bd.

193. *P. phasianellus* var. *columbianus* (Ord.). SHARP-TAILED GROUSE. If this species now occurs it is extremely rare. Mr. Kennicott notes it as "not uncommon formerly." At present it is restricted to the north-western portion of the state. The last record of its occurrence in this vicinity is furnished by my friend Mr. T. H. Douglas, who informs me that in the fall of 1863 or 1864, while two gentlemen were shooting prairie chickens near Waukegan, they found and secured a covey of these birds, numbering fourteen individuals. These had, in all probability, been raised in the immediate vicinity.

Genus *Cupidonia* Reich.

194. *C. cupido* Bd. PRAIRIE CHICKEN. Once excessively abundant; now rather scarce within thirty miles of Chicago. Still exists in large numbers on the larger prairies, but is becoming much less numerous in all the more settled districts. In many places the farmers are in the habit of collecting their eggs by the pailful to use for culinary purposes. Such a drain as this, with the annual slaughter by sportsmen, and the restriction of their breeding grounds by cultivation, is rapidly lessening their numbers except in the remote prairie districts.

Genus *Bonasa* Steph.

195. *B. umbellus* Steph. RUFFED GROUSE. Common resident in the wooded portions. Farther north, in the forests of Wisconsin and Northern Michigan, it is very abundant and so unsophisticated that it may almost be captured with sticks.

Genus *Lagopus* Vieill.

196. *L. albus* Aud. WHITE PTARMIGAN. Kennicott gives this species as: "Sometimes found in the timber along Lake Michigan." This note was based, I think, upon the capture of two specimens, December, 1846, near Racine, as noted by Dr. Hoy. (Wis. Agr. Rep., 1852.)

Family **PERDICIDÆ.**Genus *Ortyx* Steph.

197. *O. virginianus* Bonap. QUAIL. Still a common resident, although a recent severe winter greatly diminished their numbers. Exceedingly numerous in Southern Illinois.

Family **CHARADRIIDÆ.**Genus *Squatarola* Cuv.

198. *S. helvetica* Linn. BLACK-BELLIED PLOVER. Not uncommon during the migrations. Arrives in full breeding plumage the last of May and after lingering a few days the majority pass north. A few remain during the summer and undoubtedly breed. Returning early in September in fall plumage, they remain until well into October. While with us in the migrations this species is generally solitary, sometimes a half dozen individuals joining company, or a single specimen will be found leading a miscellaneous company of sandpipers and small plovers.

Genus *Charadrius* Linn.

199. *C. fulvus* var. *virginicus* Borch. GOLDEN PLOVER. A very abundant migrant. Arrives in large flocks early in April, and at this time the black of the breeding plumage has just begun to mottle their white breasts. Frequents wet prairies until the last of the month, when it generally departs. Sometimes a few remain as late as May 5, and are then in perfect breeding dress. Returning early in September, with the fall plumage just appearing, it remains until into October.

Genus *Ægialitis* Bote.

200. *Æ. vociferus* (Linn.). KILLDEER PLOVER. Common summer resident. Arrives the first of March and departs in October. Stragglers sometimes appear in mid-winter, during a few warm days.

201. *Æ. semipalmatus* Bonap. SEMI-PALMATED PLOVER. Common during the migrations, generally in small flocks. In spring the migrations extend from April 25th to May 30th, and in fall from July

31st to the last of October. The 2nd of July, 1878, I obtained several specimens of this species near Chicago. From the condition of the abdomen and ovaries of one specimen, and the presence of several recently fledged young, I came to the conclusion that they had nested in the vicinity. It is barely possible, however, that these birds were unusually early arrivals from more northern breeding grounds, although the arrivals from the north generally begin about the last of the month. My suspicions that the species either breeds in this state, or at no far distant point, were strengthened the following season when several females examined the last of May contained eggs which would have been deposited within a short time.

202. *Æ meloda* var. *circumcincta* Ridg. WESTERN PIPING PLOVER. Very common summer resident along the Lake shore, breeding on the flat, pebbly beach between the sand dunes and shore. Arrives the middle of April and proceeds at once to breeding.

From a specimen shot the 24th of April, 1876, at Waukegan, I obtained a perfect egg, and the abdomen of several females obtained the same day exhibited unmistakable signs that they were already breeding, as did, also, the actions of the birds. Some thirty pairs were breeding along the beach at this place, within a space of two miles, and I afterwards found the birds as numerous at several points along the shore. Every effort was made to discover their nests without success, although the birds were continually circling about or standing at a short distance uttering an occasional note of alarm. The first of July, the year previous, Dr. Velie obtained young but a very few days old, at this same locality, showing that there is considerable variation in the time of breeding. This was also shown by specimens obtained the last of May,—and which I think were later arrivals than those found breeding in April,—having the ova just approaching maturity.

Departs the last of September. The larger portion of the specimens examined show the complete ring of *circumcincta*, while others exhibit but little more black than in *meloda*, or have the complete ring of the former indicated by faint black tips to the feathers across the breast.

Family **HÆMATOPODIDÆ.**

Genus **Streptilas** Linn.

203. *S. interpres* (Linn.): TURNSTONE. Common migrant along Lake Michigan. Arrives May 15th in full breeding plumage and is found until the first week in June. Returns early in August, still in breeding plumage, which is exchanged for that of winter during the last of the month. Departs about the 20th of September. While

here they are generally found in company with flocks of the smaller species of sandpipers.

Family **RECURVIROSTRIDÆ**.

Genus *Recurvirostra* Linn.

204. *R. americana* Gmel. AVOCET. A rare migrant. Generally occurs in small parties the last of April and first of May, and during September and the first of October. Frequents the borders of marshy pools.

Genus *Himantopus* Briss.

205. *H. nigricollis* Vieill. STILT. An exceedingly rare visitant. Dr. Hoy records the occurrence of a small flock near Racine, in April, 1847. In the collection of the Illinois Natural History Society, at Normal, Ill., is a fine specimen of this species, taken in McLean County, Ill.

Family **PHALAROPODIDÆ**.

Genus *Steganopus* Vieill.

206. *S. wilsoni* Sab. WILSON'S PHALAROPE. Very common summer resident in this vicinity. Found in abundance about damp prairies and on grassy marshes. Arrives about the middle of May and remains until into August. I have found its nest from the 25th of May to June 25th. The young usually appear about the middle of June and commence to fly the first of July. The breeding plumage of the female of this species is much brighter and richer than that of the male, as has been recently announced by Mr. A. L. Kumlein ("Field and Forest," July, 1876). The male builds the nest and attends exclusively to the duties of incubation, it alone possessing the naked abdomen during the breeding season. The female always remains near and shows great solicitude upon the nest being approached. The first plumage of the young, described by Dr. Coues on page 467, "Birds of the North-west," is retained until they depart for the south the last of July or early in August. The adults assume the winter plumage during July. This plumage is much like the breeding plumage of the male except that there is a hoary cast over the back and neck caused by grayish tips to the feathers, and the female has a greater amount of dull chestnut on the sides of the neck. The following description of the breeding plumage of the male is from a series of six specimens taken in Northern Illinois the last of May and first of June, 1876. Bill, legs, and feet pure black. Crown of head varying from a light to a dark blackish brown. The white stripe so evident on the nape of the female is entirely absent on young males of the preceding year, and but obsoletely indicated in old speci-

mens. The short white stripe over the eye is nearly as distinct as in the female. Sides of the neck washed with faint chestnut brown, rarely as deep even as the fore part of the breast in the female. The glossy black auricular patch, which extends under the eye to the lores on the female, is merely indicated by a brownish line mixed with the color of the neck. The chestnut stripes along the back of the female are only indicated in very old and perfect plumaged males, by a few rusty colored feathers scattered over the shoulders and among the scapulars. The upper parts vary from a dark blackish brown with each feather tipped with lighter, to a light grayish brown, the feathers bordered with ashy white. In all cases the feathers have darker centres. Rump and upper tail coverts lighter and sometimes pure white. The primaries nearly as in the female. The remainder of the wing lighter. Tail as in the female. Under parts white except on fore part of breast, which is light ashy brown, the same extending along the sides to the flanks. A very light wash of chestnut is generally present on fore part of the neck. The male averages considerably smaller than the female. The breeding plumage of the female is as described by Dr. Coues ("Birds of the North-west," p. 467).

The nest is a simple structure of fine grass blades placed in a small saucer-shaped depression, generally in a perfectly open situation where but slight concealment is afforded by the few surrounding grass blades. Sometimes the eggs are deposited directly upon the ground, without any nest other than the slight hollow. The eggs usually number four and are very dark. Their general appearance is much like that of a small killdeer's egg with an unusual amount of dark markings.

Genus *Lobipes* Cuv.

207. *L. hyperboreus* (Linn.). NORTHERN PHALAROPE. Rather rare migrant the first of May, and the last of September and first of October. Frequents slow streams or marshy pools, where, swimming gracefully from one patch of floating weeds to another, it obtains its food. It is quite gentle and unsuspicious, and I have approached in a boat within five yards of one without its showing the least concern.

Genus *Phalaropus* Briss.

208. *P. fulicarius* (Linn.). RED PHALAROPE. Exceedingly rare. Occurs only during the migrations at about the same time as the preceding.

Family **SCOLOPACIDÆ.**

Genus *Philohela* Gray.

209. *P. minor* (Gmel.). WOODCOCK. Rather common summer

resident. Arrives early in March, nests the first of April, and departs late in autumn.

Genus *Gallinago* Leach.

210. *G. wilsoni* Temm. WILSON'S SNIPE. Abundant during the migrations and not a very rare summer resident. Arrives the first of April and nearly all are gone by the first of May. Returns in fall the first of September and departs by the first of November. Mr. T. H. Douglas has obtained its eggs near Waukegan, and while there in the spring of 1876, I found several pairs during the breeding season, in various portions of the marsh near that place.

Morning and evening and throughout cloudy days in the early part of the breeding season the male has a curious habit of mounting high overhead, then descending obliquely for some distance, and as it turns upward strikes rapidly with its wings producing a loud whistling sound with each stroke. This manœuvre is repeated again and again, and appears to be performed for the same purpose as is the "booming" of the night-hawk. Besides this sound the Wilson's snipe has a peculiar, sharp cry during this season, which is uttered when the bird is disturbed. I first became acquainted with this note in May, 1876, when, while walking along a marshy strip of land, I was surprised to hear a loud *kâ-kâ-kâ-kâ-kâ*, uttered with great force and in a rather loud, harsh tone. Turning quickly I was still more astonished to find the author to be one of these birds. It was flying restlessly from post to post along a fence and showed the greatest uneasiness at my presence, the notes being repeated at short intervals. Although its nest was probably near, I could not discover it.

Genus *Macrohamphus* Leach.

211. *M. griseus* Leach. RED-BRISTLED SNIPE. Rather common migrant. Passes north, often in large flocks, in May and returns the first of August, and lingers in small numbers about muddy pools until well into October. Quite unsuspicious while feeding and will allow a near approach.

Genus *Micropalama* Bd.

212. *M. himantopus* Bd. STILT SANDPIPER. Of rare occurrence. The 8th of August, 1873, I saw a single specimen near the Lake shore in Chicago, and the 10th of September the same year, Mr. R. P. Clarke obtained a specimen at the same place.

Genus *Ereunetes* Ill.

213. *E. pusillus* Cass. SEMI-PALMATED SANDPIPER. Very abundant migrant and many remain through the summer. From repeated

dissections I am confident these are barren birds and, as Mr. Maynard suggests, probably young of the preceding year. Migrations: May 1st to 25th, and the last of August to October.

Genus *Tringa* Linn.

214. *T. minutilla* Vieill. LEAST SANDPIPER. Common migrant. Not so numerous as the preceding. Arrives the 1st of May and remains until the last of the month; returns with the preceding. The 5th of June, 1875, I found one of these birds building its nest near the Calumet River. When first observed it was busily at work in the midst of a small bunch of grass, but upon my approach it ran a few feet to one side and watched my movements. The nest was nearly finished, and was a shallow depression in the centre of the tuft of grass, formed by the bird, which had just commenced lining it with small straws. Unfortunately work was not resumed upon the nest after my visit, but the birds were noticed several times in the vicinity, and they probably had a nest in some safer spot. Several least sandpipers were observed near Waukegan the first of July, 1875, by Mr. Rice, who is certain they had nested in the vicinity.

215. *T. bairdii* Vieill. BAIRD'S SANDPIPER. A rather uncommon migrant during the middle of May, and the last of August and first of September. It is generally found in small parties or singly, with other species of sandpipers, but it sometimes occurs in large flocks.

216. *T. maculata* Vieill. GRASS SNIPER. Very abundant migrant. Sometimes uniting into large flocks containing several hundred and frequents wet prairies or marshes. At other times it can only be found singly scattered over the same territory. March 25th to May 10th, and the middle of September to the first of November. A few remain through the summer, but whether they breed or not I have been unable to decide.

217. *T. bonapartei* Schleg. BONAPARTE'S SANDPIPER. Rather uncommon migrant. Dr. Hoy writes "that it was formerly abundant during the migrations but is now rare" (at Racine). June 9th, 1876, I obtained one specimen and saw quite a number of others upon the Lake shore near Waukegan. Mr. R. P. Clarke informs me that he has taken it late in autumn upon the Lake shore near Chicago.

218. *T. maritima* Brunn. PURPLE SANDPIPER. Very rare visitant during migrations. A fine adult male obtained on the Lake shore, near Chicago, November 7th, 1871, is in the collection of Dr. J. W. Vellie. When first seen it was in company with a flock of sanderlings. This is the only instance of the occurrence of this species of which I have learned.

219. *T. alpina* var. *americana* Cass. RED-BACKED SANDPIPER. Very abundant migrant. Arrives in full breeding plumage the last of

May and is found about muddy pools and flats near the Lake until the 5th of June. Returning in winter dress during September it remains well into October. At this season it is generally found in small parties, while in spring the flocks often contain hundreds of individuals.

220. *T. caутutus* Linn. KNOR. This is another of the so-called "maritime species" which regularly visits its breeding grounds by way of the "Great Lakes," as well as along the coast. It is not a common but a regular migrant, passing north during May. It returns early in September and remains until October. I have never observed it away from the vicinity of the Lake shore, where it is generally found in company with one or two others of the same family.

Genus *Calidris* Cuv.

221. *C. arenaria* Linn. SANDERLING. Abundant migrant along the Lake shore. Arrives in full breeding plumage—which varies greatly with individuals—about the 20th of May, and is found in flocks, numbering from five to seventy-five, along the shore, until June 10th. Returns the first of August, still wearing its breeding dress, which is changed the last of the month for the duller garb of winter. Departs for the south by the 20th of October. This species, with *Æ. meloda*, is found almost exclusively along the bare sandy beach, where it would seem an impossibility for it to obtain a living.

Genus *Limosa* Briss.

222. *L. fedoa* (Linn.). MARBLED GODWIT. Rather common migrant. April 15th to May 15th, and September 10th to October 20th.

223. *L. hudsonica* Sw. HUDSONIAN GODWIT. Not very rare during the migrations. April 15th to May 10th, and September to the first of October. More common along the water courses in the western part of the state.

Genus *Totanus* Bech.

224. *T. semipalmatus* Temm. WILLET. Rare summer resident in the marshes and on wet prairies. Arrives the last of April and first of May. Departs by the first of October.

225. *T. melanoleucus* Gmel. GREATER YELLOW-LEGS. A common migrant and regular summer resident. Breeds. Arrives about the middle of April, the larger portion passing north early in May. Returns September first and remains until the last of October. In June, 1875, I found several pairs of these birds about the Calumet Marshes, where, from their actions, I was certain they were breeding, but was not fortunate enough to find their nests. The 10th of June, 1876, Mr. Rice observed a pair about a prairie slough near Evanston. A few days later a set of four eggs were brought him from a similar situa-

tion a few miles north-west of that place, and from the description of the parent bird—driven from the nest—he decided they must belong to this species. I perfectly agree with Mr. Rice's decision, for the prominent characteristics noticed by the collector are obviously applicable to this bird.

The nest was situated in a slight depression at the base of a small hillock near the border of a prairie slough, and was composed of grass stems and blades. The eggs measure respectively 1.70×1.30 ; 1.72×1.31 ; 1.74×1.32 ; 1.80×1.38 inches. The ground color is a deep grayish white, marked on three eggs with spots of dark brown, and on the other egg with spots and well defined blotches of a considerably lighter shade of the same. In addition there are shell markings and obscure spots of lilac. The markings are disposed quite abundantly over the surface of the egg, but are more numerous about the large end.

226. *T. flavipes* Gmel. LESSER YELLOW-LEGS. Much more numerous than the preceding. Frequents the same localities. Arrives a few days later and departs earlier for the south. A few breed. I obtained the young, barely able to fly, near a prairie slough the first of July, 1874, a few miles from Chicago, and have since observed several pairs during the breeding season about the Calumet Marshes.

227. *T. solitarius* Wils. SOLITARY TATLER. Common migrant. Arrives the first of May and remains until about the 25th, when the majority go farther north. I have several times taken young of this species just able to fly, and have observed the adults throughout the breeding season. I do not think there is the slightest doubt of its breeding in this vicinity. Departs for the south in August and September.

Genus *Tringoides* Bonap.

228. *T. macularius* Linn. SPOTTED TATLER. Very common summer resident. Arrives in April and departs late in autumn. Breeds in abundance among the small sand hills along the Lake shore. Near Waukegan, the first of June, 1876, I saw Mr. T. H. Douglas secure over two dozen of their eggs in considerably less than an hour. The nests were generally placed under a small shrub or in a thin tuft of grass and the eggs could be seen several yards away.

Genus *Actiturus* Bon.

229. *A. bartramius* (Wils.). FIELD PLOVER. Very common summer resident. Arrives early in April and departs in September. Frequents in greatest abundance the borders of marshes and half wild prairies. Quite difficult to approach when it first arrives, but during

the breeding season becomes perfectly reckless, and hovers over head or follows through the grass within a few yards until it has escorted the intruder well off its domain. The presence of a dog in the vicinity of its nesting place is the signal for a general onslaught by all the birds of the vicinity, which hover over the dog, and with loud cries endeavor to drive it away. Being but little appreciated as game it is seldom hunted in this vicinity.

Genus *Tryngites* Cab.

230. *T. rufescens* Vieill. BUFF-BREASTED SANDPIPER. Very rare migrant. A specimen is in the collection of Mr. R. P. Clarke, obtained upon the Lake shore, at Chicago, September 4th, 1873. Dr. Hoy gives it as "quite common" from September 15th to October 10th, near Racine (Wis. Ag'l Rep., 1852). This is, I think, a mistake, as is also his note regarding the abundance of *T. maritima* in the same list.

Genus *Numenius* Linn.

231. *N. longirostris* Wils. LONG-BILLED CURLEW. Formerly very abundant during the migrations, and a common summer resident. Now rather uncommon in the migrations and a very rare summer resident. A pair nested on the Calumet Marshes the spring of 1873. More numerous on the large marshes in Central Illinois. Arrives the last of April and departs in October.

232. *N. hudsonicus* Lath. HUDSONIAN CURLEW. Very rare migrant with the preceding.

233. *N. borealis* (Forst.). ESQUIMAUX CURLEW. Rather common during the migrations. Arrives a little later than the larger species and passes north with short delay. Returns the last of September and in October. Frequents wet prairies, with the golden plover.

Family TANTALIDÆ.

Genus *Tantalus* Linn.

234. *T. loculator* Linn. WOOD IBIS. An exceedingly rare summer visitant from Southern Illinois. Dr. Hoy has a specimen in his collection obtained at Racine, September 10th, 1869, and states that a second specimen was obtained near Milwaukee, and is now in a museum at that place.

Genus *Ibis* Mæhring.

235. *I. falcinellus* var. *ordii* Coues. GLOSSY IBIS. A very rare visitant. I know of but two or three instances of its occurrence.

Family ARDEIDÆ.

Genus *Ardea* Linn.

236. *A. herodias* Linn. GREAT BLUE HERON. Common summer resident. Arrives in April and I have seen a specimen on the Lake shore the first of December after a severe snow storm.

237. *A. egretta* Gmel. GREAT WHITE EGRET. A rather common summer visitant throughout Northern Illinois. Generally arrives the last of July and departs in September. Mr. Rice observed two specimens near Evanston, March 31st, 1875. Breeds in Southern Illinois and perhaps in other parts of the State.

238. *A. candidissima* Gm. LITTLE WHITE EGRET. Much less common than the preceding. Occurs at the same time.

NOTE. *A. cærulea* will probably be found, as it is even now more numerous in Southern Illinois during August and September than the two preceding species.

239. *A. virescens* Linn. GREEN HERON. Common summer resident everywhere except upon the open prairie, where, however, stragglers are often taken.

Genus *Nyctiardea* Sw.

240. *N. grisea* var. *nævia* Allen. NIGHT HERON. Common. Owing to its frequenting the almost impenetrable wild rice swamps this species would be overlooked on a transient visit to their haunt. The first of July, 1874, I saw a few young of the year in the Calumet Marshes, but it was not until June, 1876, that I learned anything regarding their habits in this state. The middle of this month, in company with my friend Mr. T. H. Douglas, I visited Grass Lake, Lake County, Illinois, some miles west of Waukegan. This "lake" is simply a widening of the Fox River, which flows through its centre, producing a shallow body of water a mile wide and about three miles long. A large portion of the lake is covered with a dense growth of wild rice. While collecting near a large patch of this we were surprised to see a number of night herons arise from the interior of the patch and commence circling about uttering hoarse cries. Upon examining the place we were still more surprised to find that the birds were breeding in this apparently improbable location. During this and the following day we examined, within an area of two acres, at least fifty nests of this species. They were all placed in the midst of particularly dense bunches of rice, the stiff, last year's stalks of which, converging slightly near the roots, formed a convenient base for their support. The nests were all well-built structures, composed of innumerable small pieces of dead rice stalks, varying from two to ten

inches in length. Some of the nests were quite mathematically built, the material being arranged so that the usual cylindrical form would become either a decided pentagonal or hexagonal figure. The nests averaged from twelve to fifteen inches in diameter at the top and from ten to thirty inches in depth. So firmly were they built that I several times stood upon a large nest, to take a more extended view, and did it but little damage. A few contained fresh eggs, and a few had young from one to ten days old, but the majority contained eggs with half grown embryos. The parents exhibited great solicitude while we were in the vicinity, but were so cautious that we succeeded in shooting but two.

Genus *Botaurus* Steph.

241. *B. minor* Bote. BITTERN. Very common summer resident in marshes and prairie sloughs. Arrives the last of March and departs the first of November. Nests principally in prairie sloughs. In over a dozen nests examined I have found but little variation. They are generally placed in rank swamp-grass or rushes close to the surface of the water, from which the nest is separated by a mass of grasses and other material either found upon the spot or collected from the immediate vicinity by the birds. The nest itself is a loosely formed platform constructed of the material nearest at hand, be it grass or reeds. In one instance some boys collecting for me found a nest of this species which the female refused to desert, so it was captured and brought me alive with the eggs, which were but slightly addled.

Genus *Ardetta* Gray.

242. *A. exilis* (Gmel.). LEAST BITTERN. A common summer resident everywhere in marshes and sloughs. It arrives the first of May and nests the last of this and all of the following month. The nest of this species I have always found supported, from one to three feet above the water, by the surrounding rushes. It is a very frail structure, being a thin platform from one to three inches thick, with scarcely depression enough in the centre to prevent the eggs from rolling out, and is composed of small dry pieces of reeds. The eggs vary from two to six in number. When approached while upon the nest the female generally slips quietly to one side and endeavors to find concealment, but should the approach of the intruder be hasty, she seeks safety in flight. Under ordinary circumstances this species places its nest by itself, but should an unusually good feeding ground be discovered, containing but one or two small patches of reeds, it will make the best of circumstances, and in such a place I have often found six or eight nests in close proximity.

Family **GRUIDÆ.**Genus **Grus** Linn.

243. G. americanus Linn. WHOOPING CRANE. Once an abundant migrant, but is now of rare occurrence in this vicinity. Along the Illinois River and more thinly settled portions of the State it is still common during the migrations, and a few pairs breed upon the large marshes in Central Illinois.

244. G. canadensis Linn. SANDHILL CRANE. Formerly nested abundantly on all the larger marshes, but now few remain to breed except on one or two large marshes in the central part of the State, where, I understand, they are still quite numerous.

Family **RALLIDÆ.**Genus **Rallus** Linn.

245. R. elegans Aud. KING RAIL. Common summer resident. Arrives the last of April and departs in October. Have obtained half-grown young the first of July, although they usually breed later than this. Found about grassy marshes and prairie sloughs.

246. R. virginianus Linn. VIRGINIA RAIL. Common summer resident. Arrives and departs with the preceding. I have obtained nests with eggs from the 6th of May until the middle of June. This species is found in almost any place where it can find suitable food. I have often flushed it in thickets when looking for woodcock, as well as from the midst of large marshes. The nest can rarely be distinguished from that of the Carolina rail in form or structure, and is generally placed in a similar location, with the exception that the present species shows a greater preference for dense tufts of grass. I have never seen more than nine eggs in a nest of this species.

Genus **Porzana** Vieill.

247. P. carolina Cab. CAROLINA RAIL. Exceedingly abundant summer resident in all marshy situations. Arrives the first of May and departs in October. Nests along the borders of prairie sloughs and marshes, depositing from eight to fourteen eggs. Their nest may often be discovered at a distance by the appearance of the surrounding grass, the blades of which are in many cases interwoven over the nest, apparently to shield the bird from the fierce rays of the sun, which are felt with redoubled force on the marshes. The nests are sometimes built on a solitary tussock of grass, growing in the water, but not often. The usual position is in the soft, dense grass growing close to the edge of the slough, and rarely in grass over eight inches high. The nest is a thick matted platform of soft marsh grasses, with

a medium sized depression for the eggs. In the spring of 1875, the sudden rise of the water in the sloughs in this vicinity flooded a great many water bird's nests, and among them Carolina rail's nests. Visiting the marshes soon after, I found that in every rail's nest that had been flooded the eggs had been broken by the rail piercing the side with her beak. In one instance the bird was found beside the nest, and when I looked at the eggs I found a portion of them broken and the contents still oozing out. I found that the coots (*Fulica americana*) and the gallinules had the same habit when their nests were destroyed by the water, although it was less common with them than with the rail. In autumn great numbers of these birds frequent the floating weeds along the borders of rivers where they are sometimes in such numbers that several may be killed at a single discharge. Dr. Bannister informs me that he has found quite a number of these birds lying dead, but without showing marks of injury, upon railroad tracks.

248. *P. noveboracensis* Cass. LITTLE YELLOW RAIL. Not very rare. Arrives early in May. Several specimens are taken each spring before the grass becomes sufficiently high to effectually conceal them. It undoubtedly breeds here, since the Smithsonian possesses a set of six eggs taken with the parent bird, May 17, by Mr. J. W. Tolman, at Winnebago, Illinois (fide, Prof. S. F. Baird in epist.). The following is the description of the above set of eggs from Coues's "Birds of the North-west": "They are the only ones I have seen and differ from all those of *P. carolina* in the color of the ground, which is a rich, warm buffy-brown marked at the great end with a cluster of reddish-chocolate dots and spots. Size, 1.15 by 0.85 to 1.05 by .80."

249. *P. jamaicensis* Cass. LITTLE BLACK RAIL. Like the preceding, of not very rare occurrence. Breeds. During the spring of 1875 I saw three specimens in the Calumet Marshes. The first was observed early in May. On the 19th of June, the same season, while collecting with me near the Calumet River, Mr. Frank DeWitt, of Chicago, was fortunate enough to discover a nest of this species containing ten freshly laid eggs. The nest was placed in a deep cup-shaped depression in a perfectly open situation on the border of a marshy spot, and its only concealment was such as a few straggling *carices* afforded. It is composed of soft grass blades loosely interwoven in a circular manner. The nest, in shape and construction, looks much like that of a meadow lark. The following are its dimensions in inches: inside depth, 2.50; inside diameter, 3.25; outside depth, 3.50; outside diameter, 4.50. The eggs are a creamy-white instead of clear white, as I stated in a recent article (Bull. Nutt. Orn. Club, Vol. I, p. 43), and average 1.00 by .81 inches. They are nearly perfectly oval, and are thinly sprinkled with fine reddish-brown dots,

which become larger and more numerous at one end. Minute shell markings in the form of dots are also visible. Owing to the small diameter of the nest the eggs were in two layers.

Genus *Gallinula* *Briss.*

250. *G. galeata* Licht. FLORIDA GALLINULE. Abundant summer resident everywhere in marshes and the larger prairie sloughs. Arrives the last of April or the first of May. Generally has a full set of eggs, numbering from seven to twelve, the first week of June. Its nests are placed wherever fancy dictates; on low ridges a rod or more from the water; in perfectly bare situations on the borders of marshes, or in the midst of the bulrushes or wild rice growing in several feet of water. The material used varies with the situation, from fine grasses to the coarsest rushes and fragments of wild rice stalks. In the latter case the nest often floats in the water and is held in place by the surrounding reeds. The young possess the usual black down and disproportionate feet of members of this family at an early age, but the basal two-thirds of the bill is bright red, the tip only being yellow. I have placed eggs under a hen, but the young, unless removed as soon as hatched, would scramble out and manage to get away. At this age they have a clear metallic peep, quite unlike that of a chicken.

Genus *Porphyrio* *Temm.*

251. *P. martinica* (Linn.). PURPLE GALLINULE. Very rare visitant. A male specimen was taken in May, 1866, by Mr. C. N. Holden, Jr., near Chicago, and Dr. Hoy informs me of its capture at Racine.

Genus *Fulica* *Linn.*

252. *F. americana* Gmel. COOT. Exceedingly abundant. Summer resident in large marshes, and it is far from rare in any marshy situation. Arrives the last of April and remains until the last of November. Nests at the same time as the Florida gallinule, but shows a greater preference for reed patches in which its nests are usually located, often in from two to four feet of water. The nests are generally larger than those of gallinules, and rarely composed of other material than the dry stalks of reeds. Dr. Coues' description of the nidification of this species will answer for most of the cases I have observed, and I have examined a large number of nests. (See "Birds of the North-west," p. 542.) As winter approaches, and the marshes and shallow pools become covered with ice, these birds congregate in immense flocks on the rivers and small lakes, and remain until the cold weather closes the streams.

This bird has a curious habit when approached by a boat in a stream, rising often before the boat is within gunshot, and flying directly by the boatman, generally so near that it may be easily brought down. The abundance of ducks and other game birds has caused the birds of this family to be but little molested, until within a few years, when the amateur sportsmen from Chicago, finding the ducks difficult to obtain, and "mud hens," as coots and gallinules are called, conveniently tame, have turned their batteries upon them and have caused a diminution in their numbers about the Calumet Marshes. But in the more retired marshes they still breed in undiminished numbers.

Family **ANATIDÆ.**

Genus **Cygnus** *Linn.*

253. C. buccinator *Rich.* TRUMPETER SWAN. Occurs during the migrations. Far from common.

Although many examples of the following species are brought to the Chicago market during the migrations, it is very rarely that this species occurs.

254. C. americanus *Sharp.* AMERICAN SWAN. Rather common during the migrations and a winter resident in the southern extreme of the state. In the spring of 1876 they were more numerous than usual; quite a large number of specimens were in market and many were seen on the small lakes and large prairie sloughs in this vicinity.

Genus **Anser** *Linn.*

255. A. albifrons var. **gambeli** *Cs.* WHITE-FRONTED GOOSE. Very abundant migrant, occurring in large flocks. Arrives from the north in October, and disperses over the state. Found in large numbers in corn fields in the central portion of the state, where hundreds are killed and shipped to the market. When the streams become frozen they remove farther south. Return early in March and frequent the same localities until about the first week of April, when, in company with the various other small species of geese, they depart for the north. During late seasons they occasionally linger until the last week of April.

The individual variation in this species is very great. A large majority have the ordinary white frontal band and the under parts plentifully mottled with black. In others the black gradually decreases until some specimens do not show the least trace of dark on the abdomen; in such instances the frontal white band is usually present. The young exhibit a dark brown frontal band in place of white, but with more or less dark spots on the abdomen. In very high plumage the abdomen becomes almost entirely black, only a few rusty colored

feathers being interspersed through the black. The white nail on the bill is generally crossed by one or more longitudinal stripes of dark horn color. In spring, as the breeding season approaches, the bill becomes a clear waxy yellow. There is also much variation in size among adults of this species. I have examined a number of specimens which by direct comparison were at least *one-fourth* smaller than the average.

256. *A. caerulescens* Linn. BLUE GOOSE. Although less abundant than the preceding species, it is far from uncommon. Many are sent to the Chicago market with the preceding during the migrations. During some seasons the blue geese are nearly as numerous as the white-fronted. Its habits and migrations, while with us, are essentially the same as those of the preceding species. The adults of this species invariably possess the white head and upper part of the neck, which in the younger specimens is more or less variegated with dark feathers. These disappear as the bird becomes older, and in many the head is a pure snowy white, in sharp contrast to the dark plumage of the rest of the upper parts. The young would appear, at first sight, to be a distinct species, so different is the pattern of coloration. The white of the head, neck, abdomen and tail coverts is entirely absent, and the bird is of an almost uniform ashy plumbeous, slightly darker about the head and lighter on the abdomen. This plumage is retained until the second year, at least, as many specimens are procured in spring with the dark head, neck and abdomen still immaculate, and these, I think, are young of the preceding year. At the same time specimens are found with the dark feathers about the head well mixed with white, representing the second year. In birds of the third year the white predominates, but not until the fourth or fifth year does the plumage become perfect.

257. *A. hyperboreus* var. *hyperboreus* Pall. SNOW GOOSE.

257a. Var. *albatus* Cass. LESSER SNOW GOOSE. Both forms are found throughout the state during the migrations, and, although Mr. Ridgway gives the *albatus* as the more common form, I think they occur in about equal numbers. The adult plumage of this species, as is well known, is pure white, with the primaries tipped with jet black. The young are quite different. The crown, back of neck and fore part of shoulders are dark plumbeous; the tip of each feather being whitish produces a grizzled appearance. A dark line extends from the eye to the upper angle of the bill. The frontal region, cheeks, throat, fore part of neck, breast, sides of body and rump are soiled ashy, lighter than the back of the head and neck, and appearing much as though caused by the continued contact of white feathers with dark earth; but a close examination shows that the effect is produced by each feather being mottled with fine dusky spots, which on the sides nearly

cover the entire feather. The shoulders, scapulars, tertials, greater coverts and secondaries, are of a varying shade of dark plumbeous edged with lighter, which, on the tertials and secondaries, becomes pure white, and is of considerable width. The tail feathers are much the same and the lesser wing coverts are like the sides of the neck—a grizzly ashy. The bill, feet, and tips of the primaries are black, as are two or three of the outer secondaries. This species generally migrates in flocks of large size, consisting only of its own kind. At times, however, the three species unite and proceed in company. It frequents the cornfields in Central Illinois while here, and migrates a little later in the fall, and earlier in the spring, than the white-fronted goose.

Genus *Branta* Scopoli.

258. *B. bernicla* Linn. BRANT GOOSE. Probably a rare visitant, but the only instance known to me of its capture in this portion of the country is a specimen taken by Dr. Hoy, from a flock of three, upon the Lake shore near Racine. The bird is now in his collection.

259. *B. canadensis* var. *canadensis* Linn. An abundant migrant. Arrives early in October and remains until the first of December. Returns in March and remains until well into April. Formerly bred commonly in the marshes throughout the state, and still breeds sparingly in the more secluded situations.

259a. Var. *hutchinsi* Rich. HUTCHINS' GOOSE. Rather common, but not the most common form, as my friend Mr. Ridgway states in his "Catalogue of Illinois Birds." I once had the pleasure of examining a series of Canada Geese which were sent to market by the same hunter, and obtained the same day in Central Illinois. Among the eight specimens in the lot were typical representatives of the two forms, above-named. In addition were several specimens which formed a direct chain in which it was impossible to tell where one variety ended and the other commenced. The size of the specimens, the coloration, and indeed every particular, aided in perfecting the series, except the number of tail feathers, which was eighteen throughout. In *hutchinsi* I have found this to be a very variable character, as a large portion of the specimens which agree perfectly with the dimensions of the latter possess the eighteen tail feathers, instead of sixteen, as given by authors.

Genus *Anas* Linn.

260. *A. boschas* Linn. MALLARD. An exceedingly abundant migrant and common summer resident in the more secluded marshes. Once nested abundantly in the prairie sloughs and along borders of marshes. The spring migrations extend from the last of March to

the middle of April. Autumnal, from the last of September until the last of November. The full complement of eggs is deposited before the middle of May, in some tussock of grass near the edge of the marsh.

261. *A. obscura* Gmel. DUSKY DUCK. An uncommon migrant with the preceding, and a very rare summer resident. Among the countless number of mallards killed yearly in this state are scarcely found more than one in two hundred of this species. One or two pairs nest each year on the Calumet Marshes.

Genus *Dafila* Leach.

262. *D. acuta* (Linn.). PINTAIL DUCK. Very abundant migrant, and rare summer resident. Arrives early in October and remains until the last of November; in spring passes north by the first of April. Each year a few pairs breed upon the marshes in this vicinity, but whether they breed in the State away from the Lake region I have no means of knowing. In the spring of 1875 several pairs of these birds nested in the prairie sloughs near the Calumet River, and on the 29th of May I found a nest containing three freshly laid eggs. The female was flushed from the nest when scarcely more than a rod away, and was at once joined by the male from a small slough a few rods distant. The nest was in the centre of a tall, thick bunch of grass on a small ridge between two sloughs, and was a slight hollow thickly lined with grass stems; no down had been added. The parent birds circled about overhead, often coming within gunshot, during the whole time I was in the vicinity. The eggs average 2.25 by 1.50, and are a grayish olive, similar to the set described by Dr. Coues ("Birds of the North-west," p. 563).

In June, 1876, several pairs were seen at Grass Lake, on the Fox River, but their nests were not discovered. In the collection of Dr. J. W. Velle is a male hybrid between this species and the mallard.

Genus *Chaulelasmus* Gray.

263. *C. streperus* (Linn.). GADWALL. This beautiful species is very common during the migrations from the middle of October to the last of November, and from the first to the last of April. A very rare summer resident. I have seen but two or three pairs here in the breeding season.

Genus *Mareca* Steph.

264. *M. penelope* Selby. EUROPEAN WIDGEON. Exceedingly rare straggler. Two instances are known; one quoted by Mr. Ridgway on the authority of D. G. Elliot, in "Proceedings of the Zoological Society" (see Ridg., Cat. Birds Ascer. to occur in Ill., 268), and a second is furnished by Mr. C. N. Holden, jr., who informs me that a fine

adult male was shot on the Calumet Marsh, April 13, 1876, and is now preserved in a collection in Chicago. It has also been shot on Lake Mendota, in Wisconsin, by Mr. Kumlien (Hoy).

265. *M. americana* (Gmel.). AMERICAN WIDGEON. A very abundant species during the migrations and not very rare summer resident. Arrives in spring about the middle of March and remains until about April 20th. It nests about the borders of marshes and prairie sloughs. While here during the migrations these birds show a decided preference for the open water on overflowed marshes and large sloughs, and are very difficult to approach. Immense numbers are shot along the various rivers in the state and sent to the Chicago market.

Genus *Querquedula* Steph.

266. *Q. carolinensis* (Gmel.). GREEN-WINGED TEAL. Very common migrant. Arrives about the 5th to the 10th of April, and the majority pass north by the 25th. Returns the first of October, and remains until into November. Breeds sparingly. I have known of a few instances of its nest being found, and have myself observed several pairs of the birds in this vicinity during the breeding season.

267. *Q. discors* (Linn.). BLUE-WINGED TEAL. Very abundant migrant and a common summer resident in all suitable localities. The middle of May, 1875, I obtained a nest of this species containing fourteen freshly laid eggs. The parent was flushed from the nest within a few yards. It was situated near a branch of the Calumet Marsh and close to the rail-road track, being about midway between the track and fence in a dense bunch of grass. The nest was a well matted structure composed of feathers and grass, with the rim turned in so as to partly cover the bird when sitting. As has been the case each time I have discovered a duck's nest, and often when I have been in the vicinity of one not known to me, the parents circled about me the entire time I was near the nest, often coming within gunshot and exhibiting considerable anxiety. Arrives a few days later than the preceding in spring, and leaves at about the same time in autumn.

Genus *Spatula* Boie.

268. *S. clypeata* Linn. SPOONBILL DUCK. An abundant migrant and rather common summer resident. Breeds in much the same localities as the preceding. Its eggs are deposited early in May. Arrives the last of March, and the larger number pass north before April 20th. The autumn migrations extend from the first of October until the middle of November.

Genus *Aix* Sw.

269. *A. sponsa* Boie. WOOD DUCK. Common migrant and

rather common summer resident in secluded localities, and is especially abundant in the "bottoms" along the rivers in the southern part of the state. Arrives early in April and departs the last of October.

Genus *Fuligula* Steph.

270. *F. marila* (Linn.). GREATER SCAUP DUCK. A rare migrant. Present with the following species in about the same proportion that *A. obscura* bears to *A. boschas*.

271. *F. affinis* Forst. LESSER SCAUP DUCK. An exceedingly abundant migrant and in years when the Lake does not become frozen over is a resident through the year. This is not an uncommon species upon the larger marshes and inland lakes during the breeding season. Commence to arrive in large numbers from the south the last of February or first of March, according to the season, and are mostly gone by the 20th of April. About the time they leave for more northern breeding grounds they congregate in very large flocks on rivers or small lakes, and soon all have disappeared from these haunts and none, except the comparatively few which remain to breed, are found there again until they return in autumn, about the 5th to 10th of October. Flocks may be found upon Lake Michigan from one to two weeks after they have left the inland waters. Their young are hatched from the first to the middle of June.

272. *F. collaris* Donov. RING-NECK DUCK. In about equal numbers with the preceding during the migrations. Its habits, haunts, and time of migration, agree very closely with those of the little scaup duck. This species also breeds about the marshes in North-Eastern Illinois, but in smaller numbers than the preceding.

273. *F. ferina* var. *americana* Eyton. RED-HEAD DUCK. Very common migrant. Arrives the last of March and lingers until the last of April. Returns the last of October and remains until the wild rice swamps freeze over, the last of November.

274. *F. vallisneria* Wils. CANVAS-BACK DUCK. Very common migrant. Migrates with the preceding. Like other species of the *Fuligulinae* found here, the canvas-back shows a liking for open water and is more numerous on the small inland lakes than in the marshes.

Genus *Bucephala* Baird.

275. *B. clangula* (Linn.). GOLDEN-EYE DUCK. Common migrant throughout the state and abundant on Lake Michigan, where it is usually a winter resident. This is usually a very shy species, but occasionally it exhibits great stupidity. I have known of several being shot from an open boat upon the Lake, by placing out wooden decoys which they would approach, sometimes while the gunner was

standing in plain view. This, however, was a rare occurrence. Arrives the last of October or first of November, and departs the first of April.

276. *B. islandica* Bd. BARROW'S GOLDEN-EYE DUCK. A winter resident upon Lake Michigan, and found irregularly throughout the state at that season. A specimen was obtained at Mt. Carmel, on the Wabash River, in December, 1874, by Professor F. Stein, and I have observed it at Chicago. Dr. Hoy writes that a specimen was shot at Racine during the winter of 1860. They are probably not uncommon upon the Lake in winter, but owing to the great difficulty experienced in collecting ducks on perfectly open water at this season, a definite knowledge of the numbers in which this and several other aquatic species visit us during winter has not been obtained.

277. *B. albeola* Bd. BUFFLE-HEAD DUCK. The most abundant species of the genus. Frequents the rivers and other inland waters in greatest abundance. Immense numbers are sent to the Chicago market each season. Although abundant with the preceding upon Lake Michigan, it is still more numerous on the inland waters. Winter resident. Arrives the last of October and sometimes remains until the first of May.

Genus *Harelda* Leach.

278. *H. glacialis* (Linn.). OLD-WIFE DUCK. An exceedingly abundant winter resident upon Lake Michigan and sparingly dispersed throughout the state during that season. It was obtained by Professor Stein at Mt. Carmel, in December, 1874. A few stragglers make their appearance the last of October, but the main body do not arrive until about the first of December. The last of March or first of April nearly all depart for the north, but a few are found until the last of the month. Just before they migrate they unite in large flocks and make a great gabbling and noise. At all times while here they are very shy and difficult to obtain.

Genus *Histrionicus* Lesson.

279. *H. torquatus* (Linn.). HARLEQUIN DUCK. Rather rare winter resident upon Lake Michigan. Dr. Hoy has secured several specimens at Racine.

Genus *Somateria* Leach.

280. *S. mollissima* Leach. EIDER DUCK. Not a very rare winter resident upon Lake Michigan and probably occurs in suitable places throughout the state. In my collection is an immature specimen, obtained near Chicago in December, 1874, and Dr. H. B. Bannister has several times noted them at Evanston. Dr. Hoy informs me that a specimen was shot at Racine in January, 1875.

281. *S. spectabilis* Leach. KING EIDER. Rare winter visitant—perhaps winter resident—to Lake Michigan and other parts of the state. “An adult female, obtained at Chillicothe, on the Illinois River, in the winter of 1874, has been sent to the National Museum by W. H. Collins, Esq., of Detroit, Mich.” (Ridgway). “A single specimen has been taken at Milwaukee, Wisconsin, and is preserved in a collection at that place” (Hoy).

Genus *Cedemia* Flem.

282. *Ce. americana* Sw. BLACK SCOTER. Rather common upon the Lake. Winter resident. Arrives the first of November and departs by the first of April.

283. *Ce. fusca* (Linn.). VELVET SCOTER. Like the preceding a rather common winter resident upon the Lake, and occurs throughout the state, specimens being sent to the Chicago market from the Illinois River and various other streams in Central Illinois.

284. *Ce. perspicillata* Steph. SURF DUCK. A common winter resident upon Lake Michigan and occurs throughout the state at this season. Quite a number of specimens were taken upon the Calumet Marshes during the fall of 1875, and many others seen. Arrives the last of October and departs the last of March. “A single specimen, an immature bird, was obtained at Mt. Carmel by Professor Stein in October, 1875” (Ridgway).

Genus *Erismatura* Bonap.

285. *E. rubida* Bonap. RUDDY DUCK. Very common during the migrations. Summer resident. Breeds. The spring migration begins about the middle of April and continues until the 5th of May. A few return as early as the first of October, but the main fall migration commences the last of this month and extends to the first of November. The middle of September, 1875, my friend Mr. T. H. Douglas, of Waukegan, found a pair with eight or ten full grown young in a small lake near that place, and obtained several specimens. As the fall migration of this species does not commence until some weeks later than this, I think it very probable these birds were hatched in the vicinity. This supposition is rendered still more reasonable by the following observations. The 12th of June, 1875, while walking through the dense grass close to the shore of Calumet Lake, looking for sharp-tailed finches, a female ruddy duck started from the grass a few yards in advance and flew heavily away and alighted in the reeds a short distance out from shore. Being well acquainted with the species, I at once recognized the bird by unmistakable peculiarities of form and flight, as well as coloration, so I did not shoot it as I could easily have done, but instead, made a thorough search for the

nest, which I was certain must be near. The dense grass, about three feet high, proved an effectual shield, however, and I was compelled to depart without the coveted eggs. The middle of June, 1876, while rowing among the numerous rice patches upon Grass Lake, in company with Mr. T. H. Douglas, a ruddy duck arose a short distance in advance and flew off in plain view, leaving no doubt as to the species, as we both recognized it at sight. The only other record of the occurrence of this species in the United States during the breeding season is that of Dr. Cones, who, while connected with the Northern Boundary Survey, found them breeding in numbers in Northern Dakota and Montana.

Genus *Mergus* Linn.

286. *M. merganser* Linn. GOOSANDER. Very common migrant, and a few remain about airholes in streams and ponds or upon Lake Michigan, during the winter. I do not think this species remains to breed, but it is barely possible it may in rare cases. Arrives the last of October and departs the last of March and first of April.

287. *M. serrator* Linn. RED-BREASTED MERGANSER. The rarest species of the genus in this vicinity. Frequents small reedy lakes, where it is a rare summer resident. Nests upon old muskrat houses. The migrations are: in fall, from October first to the last of November; in spring, the last of March to the first of May. A very rare winter resident. During the height of the migrations it is rather common upon Lake Michigan in small flocks.

288. *M. cucullatus* Linn. HOODED MERGANSER. Very abundant migrant. Common winter resident upon Lake Michigan. Breeds sparingly throughout the state. Arrives the last of October and remains until the first of April. The last of August, 1875, I found several pairs of these birds with partly grown young upon some small lakes in Union County, Southern Illinois.

Family PELECANIDÆ.

Genus *Pelecanus* Linn.

289. *P. trachyrhynchus* Lath. WHITE PELICAN. At present an exceedingly rare visitant during the migrations. Formerly they were regular and rather common migrants. Still migrate along the Mississippi River.

Family GRACULIDÆ.

Genus *Graculus* Linn.

290. *G. dilophus* var. *dilophus* Sw. DOUBLE-CRESTED COR-

MORANT. A regular but rather uncommon migrant and sometimes a winter resident.

290 a. Var. floridanus Aud. **FLORIDA CORMORANT.** A regular summer resident in Southern Illinois, occasionally straying to the northern portion of the state. A specimen of this variety was observed in May, 1876, at Waukegan. I do not think *G. carbo* occurs in this vicinity.

Family **LARIDÆ.**

Genus **Stercorarius Briss.**

291. S. pomatorhinus Vieill. **POMARINE JAEGER.** A rare winter visitant to Lake Michigan. It was first observed by Mr. F. L. Rice near Evanston and upon the strength of this introduced to the fauna of the state. I am happy to record a second instance of its occurrence near Chicago, October 9th, 1876, when I observed a fine adult specimen flying along the Lake shore, and so near that there could be no possibility of mistake.

Genus **Larus Linn.**

292. L. glaucus Brünn. **GLAUCUS GULL.** A rather rare winter visitant to Lake Michigan. Dr. Hoy has killed three specimens upon the Lake near Racine, one of which is now preserved in his collection. He has seen others during severe winters.

293. L. leucopterus Fabr. **WHITE-WINGED GULL.** A regular and not uncommon winter resident on Lake Michigan.

294. L. marinus Linn. **GREAT BLACK-BACKED GULL.** Not an uncommon winter resident upon Lake Michigan. The immature young are greatly in excess of the adults.

295. L. argentatus var. argentatus Brünn. **EUROPEAN HERRING GULL.** Very rare winter visitant to the Lake. A single specimen, an adult female, was obtained in the Chicago Harbor March 27, 1876. Dr. Coues records two other specimens of this form obtained in this country, one in Mr. Lawrence's private cabinet and the other in the Cambridge Museum (see B. of N. W., p. 628). The Illinois specimen has been examined by Dr. Coues and Mr. Ridgway and pronounced by them to be identical with the European bird. The most striking peculiarity is its small size and the white terminal space over two inches long, upon the outer primary. The dimensions of my specimen are as follows: length, 22·50; wing, 15·80; tarsus, 2·25; bill, 1·90. Iris hazel.

295 a. Var. smithsonianus Coues. **AMERICAN HERRING GULL.** Very abundant winter resident upon Lake Michigan, and occurs throughout the state. Large numbers frequent the prairie near the slaughter houses, in the vicinity of Chicago, where they find a gene-

rous supply of offal. Arrives from the north during October, and the adults, with the greater portion of the young, move north the middle of April. I do not think that the young breed until they don the perfectly adult plumage, for, in June, 1876, I found a large flock consisting of about two hundred immature gulls, nearly all of this species, upon the Lake shore near Waukegan, and upon making inquiries learned that each year about the same number were in the habit of remaining at this place through the summer. The flock contained birds in every stage of plumage between the last year's young and the adult birds, of which a few were present. The large number of fishing nets set at Waukegan explained their preference for that locality. A colony of these birds breed on an island in the channel between Lake Michigan and Green Bay, and many others at various places on Lake Superior.

296. *L. delewarensis* Ord. RING-BILLED GULL. Common migrant along the Lake. Very rarely remains through the winter. Most common with us September 20th to November 30th, and March 20th to the first of May. A few young of this species were, with the flock of young herring gulls, observed at Waukegan in June.

297. *L. tridactylus* Linn. COMMON KITTIWAKE GULL. A rare winter visitant to Lake Michigan. Dr. Hoy writes that in the winter of 1870 a single specimen of this species kept about the harbor for several days, but was too shy to be shot. He is quite certain of his identification, as he examined the bird carefully with a large field glass, while it was standing upon a piece of ice just out of gun shot.

298. *L. atricilla* (Linn.). LAUGHING GULL. "Summer visitant" (Ridgway). I give this species entirely upon the strength of its occurrence in Mr. Ridgway's Catalogue (Ann. N. Y. Lyc. N. H., Jan., 1874).

299. *L. franklini* Rich. FRANKLIN'S GULL. A rare visitant to Lake Michigan. A specimen was obtained at Milwaukee in 1850, and is preserved in a collection at that place (Hoy). This species undoubtedly is of more or less regular occurrence during the migrations in company with the immense numbers of *L. philadelphia* which pass along the Lake to their breeding grounds.

300. *L. philadelphia* Ord. BONAPARTE'S GULL. Exceedingly abundant migrant. Arrives in large numbers, and usually in full breeding dress, the 5th to 10th of April, and the majority, after lingering along the shore a few weeks, pass north to their summer resorts, during the first two weeks of May. Returning the last of August, while resuming the winter dress, they remain more or less abundant until well into November. In very mild winters a few remain during the season. As is the case with the herring gull, many of the young of this species do not proceed north, but remain along the Lake during the

breeding season. Instead of remaining about sand bars, however, they prefer the fishermen's stakes out half a mile or more from shore, and it is rarely that they cannot be found at such places during the summer months. The autumn moult occurs the last of August.

Genus *Xema* Leach.

301. *X. sabinei* Bonap. FORK-TAILED GULL. Exceedingly rare visitant to Lake Michigan. While collecting on the Lake shore near Chicago, the first of April, 1873, I saw a specimen of this bird in a small pool of water on the beach. At first I supposed it was a Bonaparte gull, and was about passing it, when it arose, and as it passed toward the Lake I saw it was something new to me, and fired. It flew a few rods and fell into the Lake about thirty yards from shore. It was in perfect breeding dress, as was shown by the black markings on the head, each time it was raised while struggling in the water. A gale from off shore soon drifted it from sight.

Genus *Sterna* Linn.

302. *S. anglica* Mont. GULL-BILLED TERN. An exceedingly rare visitant during summer.

303. *S. caspia* Pall. CASPIAN TERN. An irregular but not uncommon visitant during the migrations and in winter upon Lake Michigan. The 9th of June, 1876, I saw a fine specimen fishing along the Lake shore, at Waukegan. Its occurrence so late is very unusual. Dr. Bannister has frequently observed it at Evanston in winter.

304. *S. regia* Gamb. ROYAL TERN. An exceedingly rare summer visitant to Lake Michigan. A specimen was taken at Milwaukee many years since and preserved in a museum there (Hoy).

305. *S. hirundo* Linn. WILSON'S TERN. Very abundant migrant. From April 28th to May 10th, and the middle of October, are the times of the greatest abundance of this species. A few still breed on small islands at the northern end of the Lake, where they once nested in abundance. I have never observed it here during the breeding season.

306. *S. forsteri* Nutt. FORSTER'S TERN. Migrates with the preceding, but in less abundance. Rather common summer resident in this portion of the state. Breeds in the numerous small, reedy lakes. The young fly about the middle of July.

On page 679, "Birds of the North-west," Dr. Coues states that "in the interior" *forsteri* "almost replaces *hirundo*, being, in fact, the most characteristic species." This is the case during the breeding season, as *hirundo* seeks the larger and more open bodies of water, and *forsteri* prefers the small lakes and reedy streams. During the

migrations, however, the hosts of *hirundo* moving to or from their northern breeding places greatly outnumber *forsteri*.

The above is true of Illinois, and will, I think, apply equally well to other points in the Mississippi valley, where the two forms occur. This and the preceding are in breeding plumage when they arrive in spring. White feathers commence to replace the black cap early in August in *forsteri*. Although I have been aware that *S. forsteri* nested in this vicinity for several years, it was not until the middle of June, 1876, that I had the pleasure of examining one of their nests. While we were collecting eggs among the wild rice patches, on Grass Lake, June 14th, Mr. Douglas observed a pair of these terns hovering near a small patch of *Sagittaria* leaves growing in several feet of water, and rowing to the spot found the nest, which was a loosely built structure of coarse pieces of reeds resting upon a mass of floating plants and concealed from view by the surrounding leaves. Upon the side of the nest was a single young bird, about to scramble into the water, but upon seeing Mr. Douglas it crouched to avoid being observed, and was captured. A thorough search at the time failed to reveal any other young ones, so the adults, which had been darting and screaming about his head, were secured, with a second pair which had espoused the cause of their companions. Their anxiety we afterwards found to be the proximity of an unfinished nest, similarly situated. That evening we found and secured two more young upon the nest found in the morning. The next morning fortune favored me, and, while passing between several floating masses of decaying vegetable matter I observed four small heaps of wild rice stalks resting upon one of these masses, and on a nearer view, to my delight they proved to be the desired nests containing eggs. The nests were situated in a line, and the two outer ones were not over twenty-five feet apart. The only materials used were pieces of wild rice stems, which were obviously brought from some distance, as the nearest patch of rice was several rods distant. The nests were quite bulky, the bases being two feet or more in diameter. The greatest depth was about eight inches, and the depression in the centre so deep that while sitting in the boat a rod away the eggs were not visible. Two of the nests contained three eggs, and two contained two eggs, each. The following are the measurements of three of the eggs, representing the amount of variation: 1.70 by 1.25; 1.75 by 1.20 and 1.68 by 1.25. The ground color varies from a pale greenish to a warm brownish drab. The spots and shell markings are of a varying shade of brown, distributed much as in the other small tern's eggs.

While near the nests the birds were circling high overhead, now and then uttering a harsh cry, but, concealing myself in the rice near by, I soon secured several of the parent birds as they flew about the

nests, uttering angry cries at the spoliation of their treasures. After the first bird fell into the water, the others showed the usual sympathy of their kind, but as the third or fourth specimen was killed, the remainder cautiously withdrew and uttered their complaints at a safer distance. Several other pairs were nesting on the Lake at this time, but we were unable to find their nests.

308. *S. superciliaris* Vieill. LEAST TERN. A very rare summer visitant in this vicinity. A fine male specimen is in the collection of the Chicago Academy of Sciences, obtained June 11, 1876, upon the Calumet Marshes.

Genus *Hydrochelidon* Boie.

309. *H. lariformis* Coues. SHORT-TAILED TERN. Exceedingly abundant summer resident upon all the large marshes and prairie sloughs. Arrives the first of May and remains until the first of September, after which but few are to be found. I have taken freshly laid eggs from May 25th to June 18th. The middle of June I have taken specimens in perfect winter dress, although this is unusually early. Generally a few white feathers begin to appear near the base of the bill about this time, and by the first week of July an endless series may be seen between the perfect breeding to the perfect winter plumage. By the middle of July specimens in which the black predominates are rare. This bird frequents almost exclusively reedy streams and marshy situations, and is never found upon Lake Michigan except during the migrations, when a few specimens may be seen with the flocks of the larger terns.

The following notes upon the breeding habits of this species comprise my observations during the last two seasons, during which time I have examined between two and three hundred nests. In nearly every instance the eggs were deposited in a well-built nest formed of the surrounding material. In prairie sloughs the nests are generally located well out from shore, in from one to two and one-half feet of water, and in the midst of the fine wiry grass growing in such places. In such situations the nests are formed of a mass of the surrounding grass, consisting of both living blades and the dead straws floating in the water. These are heaped into a conical mass, upon the apex of which, resting but an inch or two above the surface of the water, the eggs were placed. As would be supposed these structures were often quite bulky. In one instance I collected all the eggs deposited in a small prairie slough, and upon visiting the place about a week later, found the birds had built smaller nests in shallow water, and deposited a second set of eggs. These were removed, and upon a third visit I found many of the birds were nesting upon the masses of dead weeds or upon old muskrat houses. The sets taken from the above nests

averaged as follows: first, three eggs; second, two eggs; third, one egg. When the nests are built upon a small lake, where the water is too deep for their nest to rest upon the bottom, they generally build a slight nest of grass stems upon a floating bog, mass of dead reeds or old muskrat houses, but a well built nest will be found in nine cases out of ten. Early in May, when farmers are ploughing near a place frequented by these terns, they often follow behind the plough and pick up the earth-worms and larvæ exposed.

An unfledged young one, which I once took home became very familiar in a few hours, and would come, upon being called by a squeaking noise, and take a fly from my fingers. It was also quite expert at capturing flies upon the floor, but it was some time before it learned to distinguish between a fragment of dirt or a nail head and the insect. Although but little over a week old it could run rapidly from place to place and appeared quite contented with its change of quarters, and but for an unfortunate accident which caused its death would, I think, have been easily raised.

Family COLYMBIDÆ.

Genus *Colymbus* Linn.

309. *C. torquatus* Brünn. LOON. Very common winter resident upon Lake Michigan. Formerly nested commonly among the small lakes in this portion of the state, but now it is of uncommon occurrence during summer.

310. *C. arcticus* Linn. BLACK-THROATED LOON. A very rare winter visitant upon Lake Michigan. There is a specimen in Dr. Hoy's collection, taken at Racine, and a second specimen was captured and preserved at Milwaukee.

311. *C. septentrionalis* Linn. RED-THROATED LOON. Very common winter resident upon Lake Michigan. Arrives late in autumn and leaves early in spring.

Family PODICIPIDÆ.

Genus *Podiceps* Lath.

312. *P. cristatus* Linn. CRESTED GREBE. Rather common upon Lake Michigan in winter. Although Mr. Ridgway states (he informs me on Mr. Kennicott's authority) that it is resident in the northern portion of the state, I have yet to see one during the summer.

313. *P. griseigena* var. *holbolli* Reinh. RED-NECKED GREBE. Rather uncommon winter resident upon Lake Michigan.

314. *P. cornutus* Lath. HORNED GREBE. Next to the Carolina Grebe, our most abundant species. Occurs commonly during the

migrations; the first of October to November 10th, and during April. Breeds sparingly in the small lakes.

315. *P. auritus* var. *californicus* Lawr. EARED GREBE. Not uncommon in winter upon Lake Michigan. Several species of grebes and a number of ducks are occasionally taken during the winter upon the hooks, set several miles off shore by the fishermen.

Genus *Podilymbus* Less.

316. *P. podiceps* Linn. CAROLINA GREBE. Very common summer resident. Arrives in April and remains until the first of November. Nests along the borders of reedy sloughs, marshes and rivers.

SPECIES NOT GIVEN IN THE PRECEDING LIST WHICH ARE KNOWN TO
OCCUR IN ILLINOIS.

1. *Peucea aestivalis*. Common, locally, in Wabash, Richland, and adjoining counties.
2. *Guiraca caerulea*. Rare in the southern half of the state.
3. *Cyanospiza ciris*. Seen in Wabash Co. in June (*Ridgway*).
4. *Caprimulgus carolinensis*. Wabash Co. (*Ridgway*).
5. *Campephilus principalis*.
6. *Falco lanarius* var. *polyagrus*. Wabash and Lawrence counties (*Ridgway*) and Rock Island (*Sargent*).
7. *Elanus leucurus*. Wabash Co. (*Ridgway*).
8. *Ictinia mississippiensis*. Abundant summer resident in the southern portion of the state. Probably occurs in Northern Illinois.
9. *Buteo nitida* var. *plagiata*.
10. *Archibuteo ferrugineus*. Under date of November 13, 1876, Mr. *Ridgway* writes me that while returning from the West the present autumn, Dr. Coues observed this species entirely across the Great Plains, and also on the prairies of Illinois, while on the Illinois side of the Mississippi, at Rock Island, it was still common.*
11. *Cathartes atratus*.
12. *Ardea herodias*. Mr. *Ridgway* states that while at Mt. Carmel, Wabash Co., September 11 to 22, 1876, he found several of these birds along the Wabash River near that place, and that one was severely wounded, but escaped.
13. *A. rufa*. Not uncommon near Cairo in August.
14. *A. caerulea*. Excessively numerous near Cairo in August.
15. *Nyctherodias violaceus*. Breeds at least as far north as Wabash Co.
16. *Plotus aninga*. Common in summer near Cairo, and seen by Mr. *Ridgway* near Mt. Carmel.

*See also Bull. Nutt. Orn. Club, Vol. II, p. 28.

LIST OF SPECIES WHICH BREED IN NORTH-EASTERN ILLINOIS.

1. *Turdus mustelinus*.
2. " *fuscescens*.
3. " *swainsoni*.
4. " *migratorius*.
5. *Harporhynchus rufus*.
6. *Mimus polyglottus*.
7. *Galeoscoptes carolinensis*.
8. *Sialia sialis*.
9. *Poliophtila cærulea*.
10. *Parus atricapillus*.
11. *Sitta carolinensis*.
12. " *canadensis*.
13. *Thryothorus ludovicianus*.
14. " *bewicki*.
15. *Troglodytes oëdon*.
16. *Cistothorus stellaris*.
17. " *palustris*.
18. *Mniotilta varia*.
19. *Helminthophaga chrysoptera*.
20. " *ruficapilla*.
21. *Parula americana*.
22. *Dendroica æstiva*.
23. " *cærulea*.
24. " *pennsylvanica*.
25. " *virens*.
26. " *pinus*.
27. *Sturus aurocapillus*.
28. " *noveboracensis*.
29. " *ludovicianus*.
30. *Geothlypis trichas*.
31. *Myiodiocetes mitratus*.
32. " *canadensis*.
33. *Setophaga ruticilla*.
34. *Progne subis*.
35. *Petrochelidon lunifrons*.
36. *Hirundo horreorum*.
37. " *bicolor*.
38. *Stelgidopteryx serripennis?*
39. *Cotyle riparia*.
40. *Vireo olivaceus*.
41. " *philadelphicus*.
42. " *gilvus*.
43. " *flavifrons*.
44. " *noveboracensis*.
45. " *belli*.
46. *Ampelis cedrorum*.
47. *Collurio borealis??*
48. " *ludovicianus*.
49. " var. *exubitoroides*.
50. *Pyrranga rubra*.
51. *Carpodacus purpureus*.
52. *Chrysomitris tristis*.
53. " *pinus*.
54. *Pyrgita domestica*.
55. *Passerculus savanna*.
56. *Pooecetes gramineus*.
57. *Ammodromus henslowi*.
58. " *passerinus*.
59. " var. *nelsoni*.
60. *Chondestes grammacus*.
61. *Zonotrichia albicollis*.
62. *Spizella pusilla*.
63. " *socialis*.
64. " *pallida*.
65. *Melospiza melodia*.
66. " *lincolni*.
67. " *palustris*.
68. *Euspiza americana*.
69. *Hedymeles ludovicianus*.
70. *Cyanospiza cyanea*.
71. *Cardinalis virginianus*.
72. *Pipilo erythrophthalmus*.
73. *Eremophila alpestris*.
74. *Dolichonyx oryzivorus*.
75. *Molothrus pecoris*.
76. *Agelaius phoeniceus*.
77. *Zantho. icterocephalus*.
78. *Sturnella magna*.
79. " var. *neglecta*.
80. *Icterus spurius*.
81. " *baltimore*.
82. *Quiscalus* var. *ænæus*.
83. *Corvus americanus*.
84. *Cyanura cristata*.
85. *Tyrannus carolinensis*.
86. *Myiarchus crinitus*.
87. *Sayornis fuscus*.
88. *Contopus borealis?*
89. " *virens*.
90. *Empidonax* var. *trailli*.
91. " *minimus*.
92. " *acadicus*.
93. " *flaviventris*.
94. *Ceryle alcyon*.
95. *Chordeiles popetue*.
96. " var. *henryi*.
97. *Anrostomus vociferus*.
98. *Chaetura pelagica*.
99. *Trochilus colubris*.
100. *Coccygus americanus*.
101. " *erythrophthalmus*.
102. *Picus villosus*.

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| 103. <i>Picus pubescens</i> . | 142. <i>Totanus solitarius</i> . |
| 104. <i>Centurus carolinus</i> . | 143. <i>Tringoides macularius</i> . |
| 105. <i>Melanerpes erythrocephalus</i> . | 144. <i>Actiturus bartramius</i> . |
| 106. <i>Colaptes auratus</i> . | 145. <i>Numenius longirostris</i> . |
| 107. <i>Otus</i> var. <i>wilsonianus</i> . | 146. <i>Ardea herodias</i> . |
| 108. " <i>brachyotus</i> . | 147. " <i>egretta</i> . |
| 109. <i>Nyctale acadica?</i> | 148. " <i>virescens</i> . |
| 110. <i>Scops asio</i> . | 149. <i>Nyctiardea</i> var. <i>nævia</i> . |
| 111. <i>Bubo virginianus</i> . | 150. <i>Botaurus minor</i> . |
| 112. <i>Falco communis</i> var. <i>anatum</i> . | 151. <i>Ardea exilis</i> . |
| 113. " var. <i>columbarius</i> . | 152. <i>Grus americanus</i> . |
| 114. " <i>sparverius</i> . | 153. " <i>canadensis</i> . |
| 115. <i>Circus</i> var. <i>hudsonius?</i> | 154. <i>Rallus elegans</i> . |
| 116. <i>Nisus fuscus</i> . | 155. " <i>virginianus</i> . |
| 117. " <i>cooperi</i> . | 156. " <i>carolina</i> . |
| 118. <i>Buteo pennsylvanica</i> . | 157. " <i>noveboracensis</i> . |
| 119. " <i>swainsoni</i> . | 158. " <i>jamaicensis</i> . |
| 120. " <i>lineatus</i> . | 159. <i>Gallinula galeata</i> . |
| 121. " <i>borealis</i> . | 160. <i>Fulica americana</i> . |
| 122. <i>Aquila</i> var. <i>canadensis</i> . | 161. <i>Branta canadensis</i> . |
| 123. <i>Haliaetus leucocephalus</i> . | 162. <i>Anas boschas</i> . |
| 124. <i>Ectopistes migratoria</i> . | 163. " <i>obscura</i> . |
| 125. <i>Zenaidura carolinensis</i> . | 164. <i>Dasia acuta</i> . |
| 126. <i>Pediceetes phasianellus</i> . | 165. <i>Chaulelasmus streperus</i> . |
| 127. <i>Cupidonia cupido</i> . | 166. <i>Mareca americana</i> . |
| 128. <i>Bonasa umbellus</i> . | 167. <i>Querquedula carolinensis</i> . |
| 129. <i>Ortyx virginianus</i> . | 168. " <i>discors</i> . |
| 130. <i>Squatarola helvetica</i> . | 169. <i>Spatula clypeata</i> . |
| 131. <i>Egialitis vociferus</i> . | 170. <i>Aiz sponsa</i> . |
| 132. " <i>semipalmatus</i> . | 171. <i>Fulix affinis</i> . |
| 133. " <i>melodus</i> . | 172. " <i>collaris</i> . |
| 134. <i>Steganopus wilsoni</i> . | 173. <i>Erimatura rubida</i> . |
| 135. <i>Philohela minor</i> . | 174. <i>Mergus serrator</i> . |
| 136. <i>Gallinago wilsoni</i> . | 175. " <i>cucullatus</i> . |
| 137. <i>Tringa minutilla</i> . | 176. <i>Sterna forsteri</i> . |
| 138. " <i>maculata</i> . | 177. <i>Hydrochelidon lariformis</i> . |
| 139. <i>Totanus semipalmatus</i> . | 178. <i>Colymbus torquatus</i> . |
| 140. " <i>melanoleucus</i> . | 179. <i>Podiceps cornutus</i> . |
| 141. " <i>flavipes</i> . | 180. <i>Podilymbus podiceps</i> . |

SPECIES WHICH OCCUR IN SUMMER, BUT ARE NOT KNOWN TO BREED.

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| 1. <i>Protonotaria citrea</i> . | 18. <i>Meleagris gallopavo</i> . |
| 2. <i>Helmitherus vermicivorus</i> . | 14. <i>Ereunetes pusillus</i> . |
| 3. <i>Dendroica</i> var. <i>albiflora</i> . | 14a. <i>Tantalus loculator</i> . |
| 4. " <i>discolor</i> . | 15. <i>Ardea candidissima</i> . |
| 5. <i>Oporornis formosus</i> . | 16. <i>Porphyrio martinica</i> . |
| 6. <i>Pyrranga aestiva</i> . | 17. <i>Graculus</i> var. <i>floridanus</i> . |
| 6a. <i>Hylotomus pileatus</i> . | 18. <i>Larus</i> var. <i>smithsonianus</i> . |
| 7. <i>Conurus carolinensis</i> . | 19. " <i>delawarensis</i> . |
| 8. <i>Strix</i> var. <i>pratensis</i> . | 20. " <i>atricilla?</i> |
| 9. <i>Syrnium nebulosum</i> . | 21. " <i>philadelphia</i> . |
| 10. <i>Nauclerus forficatus</i> . | 22. <i>Sterna anglica</i> . |
| 11. <i>Buteo</i> var. <i>calurus</i> . | 23. " <i>regia</i> . |
| 12. <i>Rhynogryphus aura</i> . | 24. " <i>superciliaris</i> . |

SPECIES WHICH OCCUR ONLY DURING THE MIGRATIONS.

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| 1. <i>Turdus alicia</i> . | 36. <i>Recurvirostra americana</i> . |
| 2. " <i>pallasi</i> . | 37. <i>Himantopus nigricollis</i> . |
| 3. <i>Stalita arctica</i> . | 38. <i>Lobipes hyperboreus</i> . |
| 4. <i>Regulus satrapa</i> . | 39. <i>Phalaropus fulicarius</i> . |
| 5. " <i>calendula</i> . | 40. <i>Macrorhamphus griseus</i> . |
| 6. <i>Troglodytes</i> var. <i>hyemalis</i> . | 41. <i>Micropalma himantopus</i> . |
| 7. <i>Anthus ludovicianus</i> . | 42. <i>Tringa bairdi</i> . |
| 8. <i>Helminthophaga celata</i> . | 43. " <i>bonapartei</i> . |
| 9. " <i>peregrina</i> . | 44. " <i>maritima</i> . |
| 10. <i>Perissoglossa tigrina</i> . | 45. " var. <i>americana</i> . |
| 11. <i>Dendroica coronata</i> . | 46. " <i>canutus</i> . |
| 12. " <i>maculosa</i> . | 47. <i>Calidris arenaria</i> . |
| 13. " <i>blackburniae</i> . | 48. <i>Limosa fedoa</i> . |
| 14. " <i>striata</i> . | 49. " <i>hudsonica</i> . |
| 15. " <i>castanea</i> . | 50. <i>Tringites rufescens</i> . |
| 16. " <i>cærulescens</i> . | 51. <i>Numenius hudsonicus</i> . |
| 17. " <i>palmarum</i> . | 52. " <i>borealis</i> . |
| 18. <i>Oporornis agilis</i> . | 53. <i>Ibis falcinellus</i> . |
| 19. <i>Geothlypis philadelphia</i> . | 54. <i>Cygnus buccinator</i> . |
| 20. <i>Myiodiodes pusillus</i> . | 55. " <i>americanus</i> . |
| 21. <i>Vireo solitarius</i> . | 56. <i>Anser</i> var. <i>gumbeli</i> . |
| 22. <i>Ammodromus lecontei</i> . | 57. " <i>cærulescens</i> . |
| 23. <i>Zonotrichia leucophrys</i> . | 58. " <i>hyperboreus</i> . |
| 24. " var. <i>intermedia</i> . | 59. " var. <i>albatu</i> . |
| 25. " <i>coronata</i> . | 60. <i>Branta bernicla</i> . |
| 26. " <i>querulea</i> . | 61. " <i>canadensis</i> var. <i>hutch-</i> |
| 27. <i>Junco hyemalis</i> . | inst. |
| 28. <i>Passerella iliaca</i> . | 62. <i>Mareca penelope</i> . |
| 29. <i>Scolecophagus ferrugineus</i> . | 63. <i>Fuligula marila</i> . |
| 30. " <i>cyanoccephalus</i> . | 64. " <i>valliseria</i> . |
| 31. <i>Sayornis sayus</i> . | 65. " var. <i>americana</i> . |
| 32. <i>Sphyrapicus varius</i> . | 66. <i>Pelecanus trachyrhynchus</i> . |
| 33. <i>Pandion</i> var. <i>carolinensis</i> . | 67. <i>Graculus dilophus</i> . |
| 34. <i>Charadrius fulvus</i> var. <i>virgin-</i> | 68. <i>Xema sabinei</i> . |
| icus. | 69. <i>Sterna hirundo</i> . |
| 35. <i>Streptopelia interpres</i> . | |

LIST OF WINTER VISITANTS AND RESIDENTS.

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| 1. <i>Myiadestes townsendi</i> . ³ | 10. <i>Chrysomitris pinus</i> . |
| 2. <i>Lophophanes bicolor</i> . ⁴ | 11. <i>Loxia leucoptera</i> . |
| 3. <i>Purus hudsonicus</i> . | 12. " <i>americana</i> . |
| 4. <i>Certhia familiaris</i> . | 13. <i>Ægiothus linarius</i> . |
| 5. <i>Ampelis garrulus</i> . | 14. " <i>canescens</i> . |
| 6. <i>Colurto borealis</i> . | 15. <i>Plectrophanes nivalis</i> . |
| 7. <i>Hesperiphona vespertina</i> . | 16. " <i>lapponicus</i> . |
| 8. <i>Pinicola enucleator</i> . | 17. " <i>pictus</i> . |
| 8a. <i>Carpodacus purpureus</i> . | 18. <i>Pyrgita domestica</i> . ⁵ |
| 9. <i>Chrysomitris tristis</i> . ⁵ | 19. <i>Junco hyematis</i> . |

³ Straggler. ⁴ Visitant from the south.

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| 20. <i>Spizella monticola</i> . | 49. <i>Fulligula affinis</i> . ^b |
| 21. <i>Eremophila alpestris</i> . | 50. " <i>collaris</i> . ^b |
| 22. <i>Corvus</i> var. <i>carnivorus</i> . | 51. <i>Bucephala clangula</i> . |
| 23. " <i>americanus</i> . ^b | 52. " <i>islandica</i> . |
| 24. <i>Pica</i> var. <i>hudsonica</i> . | 53. " <i>albeola</i> . |
| 25. <i>Cyanura cristata</i> . ^b | 54. <i>Harelda glacialis</i> . |
| 26. <i>Perisoreus canadensis</i> . | 55. <i>Histrionicus torquatus</i> . |
| 27. <i>Picus villosus</i> . ^b | 56. <i>Somateria mollissima</i> . |
| 28. " <i>pubescens</i> . ^b | 57. " <i>spectabilis</i> . |
| 29. <i>Picoides arcticus</i> . | 58. <i>Edemia americana</i> . |
| 30. <i>Melanerpes erythrocephalus</i> . ^b | 59. " <i>fusca</i> . |
| 31. <i>Sitta flammea</i> . | 60. " <i>perspicillata</i> . |
| 32. <i>Otus</i> var. <i>wilsonianus</i> . ^b | 61. <i>Mergus merganser</i> . |
| 33. " <i>brachyotus</i> . ^b | 62. " <i>serrator</i> . ^b |
| 34. <i>Syrinum cinereum</i> . | 63. " <i>cucullatus</i> . ^b |
| 35. <i>Scops asio</i> . ^b | 64. <i>Stercorarius pomatorhinus</i> . |
| 36. <i>Bubo virginianus</i> . ^b | 65. <i>Larus glaucus</i> . |
| 37. <i>Nyctea</i> var. <i>arctica</i> . | 66. " <i>leucopterus</i> . |
| 38. <i>Surnia</i> var. <i>hudsonica</i> . | 67. " <i>marinus</i> . |
| 39. <i>Astur</i> var. <i>atricapillus</i> . | 68. " <i>argentatus</i> . ^b |
| 40. <i>Buteo borealis</i> . ^b | 69. " <i>tridactylus</i> . |
| 41. <i>Aquila canadensis</i> . | 70. <i>Sterna caspia</i> . |
| 42. <i>Haliaetus leucocephalus</i> . ^b | 71. <i>Colymbus torquatus</i> . ^b |
| 43. <i>Pediacetes phasianellus</i> . ^b | 72. " <i>septentrionalis</i> . |
| 44. <i>Cupidonia cupido</i> . ^b | 73. " <i>arcticus</i> . |
| 45. <i>Bonasa umbellus</i> . ^b | 74. <i>Podiceps cristatus</i> . |
| 46. <i>Lagopus albus</i> . | 75. " var. <i>holbolli</i> . |
| 47. <i>Ortyx virginianus</i> . ^b | 76. " var. <i>californicus</i> . |
| 48. <i>Fulligula marila</i> . | |

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MONDAY, DECEMBER 11, 1876.

C. PFOUNDEN, an English gentleman who has spent thirteen years in Japan, in the British Official Service, gave a familiar talk on

JAPAN AND THE JAPANESE.

Around the room were arranged a great variety of Japanese photographs, and colored pictures were exhibited and explained in illustration of the speaker's remarks. The photographs were exceedingly fine ones, and the pictures were mostly cartoons, many of them of political significance.

^a Also in summer.

^b Young in summer.

The lecturer remarked that Oriental life is surrounded by such a halo of mystery, fiction, and travellers' twice told tales, that a true picture has been rarely given by the travellers or stock book-makers. A very large amount of printed material relating to Japan exists, but the bulk of the later works are simply reprints or compilations from previous ones.

The residents, as a rule, in far distant lands, rarely enter very deeply into the language and literature of the people among whom their lot is cast. It is like having to cross unknown lands to reach a far distant mountain; the beauties of the extended view are as yet unknown. The ignorance and jealousy of the natives form an almost insurmountable difficulty to the foreigners trying to gain an insight into the inner life of the people.

The lecturer alluded to the charm and attraction to those who persevered in the exploration of these grand hitherto untrodden fields, for the toilsome journey is frequently relieved by rays of poetic beauty, glimpses of artistic design, brilliant and grotesque coloring, interesting legend, and sketches that show a deep knowledge of human nature, and of astute and refined capabilities. Quaint humor, terse proverbs, ready wit, are found. When the meanings of conventional allusions and frequently occurring sketches are met with, the study is most attractive, and the literature and art are appreciated.

Japan since the days of Marco Polo was from time to time brought before the world by attempts to reach its fabled shores. The age of adventure started by Polo's book was followed by one of discovery. All these attempts at discovery were surpassed by that of Columbus, who, in trying to find the Zipanga of Polo, reached this continent.

The lecturer said he should present some points on

subjects away from the beaten path. He alluded to the Japanese collection at Philadelphia, and said it was by no means a good exhibit of Japanese art. The officers were most anxious to exhibit the progress made in foreign science, but the Japanese traders, who were permitted to monopolize the space allotted, took advantage to display what they considered the most salable wares.

The generally received accounts that foreigners first arrived in Japan in 1542 is not correct. I have discovered in some Japanese works that foreigners arrived there in 1529-30. They mention the arrival of *black ships*, and that the captain of these black ships gave the prince called Otomo Sorian, lord of Tanega Shima, two "pieces of fire arms." The Spaniards in trying to cross the main must have been from time to time carried on to the shores of Japan. We find accounts of curious people landing on the coast and behaving themselves strangely. There is no doubt that the foreigners who landed there have influenced the arts of the people.

From 1530 to 1630 foreigners flocked into the country in large numbers; first Spaniards and Portuguese, then the Dutch and then the English. These were confined to Nagasaki. At this time the foreigners intermarried with the natives to a large extent.

Sketches were exhibited of the island Pappenburg, from which the foreigners are said to have been thrown into the sea.

After Perry's expedition to Japan hardly a season has passed when there has not been a book written on Japan. Kœmpfer's old book is the best we have. He had to work under great difficulty. All subsequent authors have followed his method. I have dared to strike out into new fields.

A new book was lately published by Harpers called

"The Mikado's Empire." Jarvis has published quite a work, taking as his basis the Hoku-sai illustrated art works. These works give some idea of the depth of feeling of the artist. All these curious sketches and illustrations have a meaning, though not apparent to us.

The Japanese have learned to copy our way of making cheap ware with peculiar legendary ornamentation. Old lacquer objects are the bridal outfits of the daughters of the nobles of Japan.

Previous to 2300 years ago the Japanese writers treated of mythological subjects, personification, etc., and several specimens of these curious old legends were translated by the lecturer and rehearsed to the audience. The lecturer then gave the meaning of some of the old legends, as about the sun goddess being on one occasion angry with the gods. She hid herself in a cavern, and the gods sent for dancers, etc. Female curiosity tempted her to peep in through the chinks and she was caught and drawn forth by the strong armed god. Of such incidents are these legends made up.

The next relates how the wicked step-brother was compelled to slay the monsters. He heard weeping and found a very ancient man and woman in distress because their only grandchild was to be sacrificed. Proposing to rescue her from the monster he procures some *saki*, and places it in a tub. The monster, dipping each of his heads into the tub, becomes tipsy. He then cuts the monster to pieces all but the tail, which he preserves and finds to be a wonderful charmed weapon. He takes the maiden away and builds her a hut, etc., etc. Afterwards he composes the poem which is the oldest Japanese poem. It is in thirty-one syllables, a line of five, one of seven, one of five and two of seven.

The son of one of the Emperors was sent to subdue

one of the provinces. His wife accompanied him. During a storm the faithful woman jumped into the boiling waters. His whole army was saved that it might punish the barbarians. The disconsolate husband cries, *Ah! tsuma koishi*:—O my dear wife, how I grieve for you! Next the legend of a beautiful lady who escaped during the troublous times with her children. One of these children afterwards became the Shogoun Yoritomo, the founder of Kamabura, in about 1190 to 1210 (A. D.). This gave rise to a number of old stories.

Another legend refers to a demon who haunted the palace of the Mikado.

These legends are fruitful sources of song and story in Japan, and all the characters on fans, screens, and pictures have a meaning. Fans are very much used for representations of scenes and other objects. In Japan they are used for advertisements. Nine-tenths of them are intended to advertise restaurant and theatrical resorts, with representations of noted dancing girls. Sometimes on the fans are views of places to attract sight-seers and tourists.

All Japanese decorations have a meaning, either mythological, legendary, historical, symbolic, or proverbial. One common sketch represents a man slaying a remarkable animal, a symbol of difficulties overcome. A fabulous animal is a decoration for imperial robes. Every animal, bird, and tree, and their relations to each other, their combinations, have their own peculiar meaning. A pine tree represents good wishes. A swallow represents return, as "When the swallows homeward fly." And so a cherry tree and pheasant, a bird flying to the plum tree, the bamboo and tiger, and the wild boar, have each their symbolic meanings. They have caricatures of men all eyes, all ears, or all legs, figurative of those who see too

much, hear too much, or can only run away. Their proverbs are very apt, as instances cited showed.

The Japanese are beginning to imitate foreign customs and to think more of the companionship of their wives. It was not until recently that husbands walked out with their wives. The man walked with friends of his own sex, and the woman with hers.

The lecturer then described the formal way and the elaborate ceremonies with which the Japanese receive a visitor, and gave an amusing account of a call he made on a Prince in 1866. The host received him on his hands and knees, and the guest followed his example. They rose together, and the host apologized for the poor reception. Many curious details were given. The call was made to examine the Prince's collection of pictures. The Japanese does not display his pictures on the walls of his room, but keeps them in a store-house outside, calls a servant, who summons a retainer, who is directed to go to a certain place and bring such a package from such a spot. The pictures are brought in one by one in little boxes and hung up for view. A collection of swords was also exhibited in the same way. It is therefore quite a labor to see any little collection in a gentleman's house.

Mr. Pfoundes then explained the meanings of the various works of art hung about the lecture room; the significance of the objects represented in the cartoons; the trees, flowers, etc. He referred to the prevalent superstitions of the people, their belief in spirit rappings, witchcraft, etc. The *mediums* are very poor people, and are recognized by the hats they wear. They carry continually a box supposed to contain the head of a dog. Some spirit has entered into this dog and becomes the medium of communication between the two worlds. The mediums were very unwilling to show me any of their

performances, for fear, I suppose, I should expose them and spoil their business.

He stated that lovers sometimes commit suicide together, and mentioned that he once saw the bodies of a girl and her lover, tied together with her girdle, floating down the river. She had filled her sleeves with stones so that they might sink.

A great many interesting facts were narrated, and a brief and graphic account of the manner of life in Japan was given. At the conclusion of the lecture Capt. Pfoundes invited the audience to propound any questions on particular points, which they desired to have answered, and some time was pleasantly and profitably spent in this manner.



REGULAR MEETING, MONDAY, DECEMBER 18, 1876.

MEETING this evening at 7.30 o'clock. Adjourned to Friday the 22nd.



ADJOURNED MEETING, FRIDAY, DECEMBER 22, 1876.

MEETING this evening at 7.30 o'clock. The **PRESIDENT** in the chair.

Mr. WILLIAM P. UPHAM read a communication entitled "History of Stenography, with a proposal for a new System of Phonetic Short-hand Writing;" illustrating the same with diagrams and drawings on the black-board.

This communication was referred to the Publication Committee.

John P. Peabody, of Salem, was elected a resident member.

BY-LAWS

OF THE

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[ADOPTED MARCH, 1876.]

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1876.

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ESSEX INSTITUTE.

BY-LAWS.

ARTICLE I. — MEMBERS.

SECTION 1. Any person may be elected a member, at a Regular Meeting by a majority of the members present and voting, the name of such person having been proposed in writing by two members at a previous meeting.

SECT. 2. Any person not residing in the County of Essex may be elected a corresponding member upon nomination by the Board of Directors, but corresponding members shall not be eligible to office, or entitled to vote. Any member removing from, or residing out of the county, may become a corresponding member, by giving notice of his intention and paying all arrears.

ARTICLE II. — OFFICERS.

SECTION 3. The officers shall be a President, four Vice-Presidents, a Secretary, a Treasurer, an Auditor, a Librarian, and Curators of Departments who, with the Chairmen of the Standing Committees, shall be the Board of Directors.

SECT. 4. The Board of Directors may appoint an Associate Curator of any department upon nomination of the Curator of the same department; and may appoint an Assistant Librarian, upon nomination of the Librarian. But the appointment of such Associate or Assistant, shall not make him a member of the Board of Directors.

SECT. 5. The Board of Directors may at any time remove an Associate Curator or Assistant Librarian.

ARTICLE III. — COMMITTEES.

The following Committees shall be chosen at the Annual Meeting:

SECTION 6. A Finance Committee (of which the President shall be *ex officio* Chairman, and the Treasurer *ex officio* a member), to have the direction of the funds of the Institute, in accordance with the Act of Incorporation, and of such investments of funds as may be necessary.

SECT. 7. A Library Committee (of which the Librarian shall be *ex officio* a member), who shall make an annual examination of the condition of the Library.

SECT. 8. A Committee on Publications, who shall have the management of all publications of the Institute, and regulate the manner of their distribution.

SECT. 9. A Lecture Committee, who shall have charge of all lectures and public meetings, except such as may be held or given for the benefit of a special department of the Institute, and except Field Meetings.

SECT. 10. A Committee on Field Meetings (of which the Secretary shall be *ex officio* Chairman) who shall determine when and where Field Meetings shall be held, and shall have the general management of the same.

SECT. 11. Each of these Committees, unless herein otherwise provided for, shall choose a Chairman, whose election shall be immediately certified to the Secretary, and such election shall constitute him a Director.

SECT. 12. The several Committees shall report at the Annual Meeting.

ARTICLE IV. — DEPARTMENTS.

The Management of the Institute shall be divided into the following Departments:—

SECTION 13. The Department of History, which shall include Historical Materials and Antiquities.

SECT. 14. The Department of Manuscripts.

SECT. 15. The Department of Archæology, which shall include Ethnology.

SECT. 16. The Department of Numismatics.

SECT. 17. The Department of Geology, which shall include Mineralogy, and Palæontology.

SECT. 18. The Department of Botany.

SECT. 19. The Department of Zoölogy.

SECT. 20. The Department of Horticulture.

SECT. 21. The Department of Technology.

SECT. 22. The Department of Music.

SECT. 23. The Department of Art, embracing Painting, Sculpture, and Engraving.

ARTICLE V. — MEETINGS.

SECTION 24. Regular Meetings shall be held on the first and third Mondays of each month, at the Rooms of the Institute, at 7½ o'clock, P. M. The second meeting in May shall be the Annual Meeting.

SECT. 25. Special Meetings may be called by order of the President, or at the written request of five members. Business to be transacted at a special meeting shall be limited to the subjects stated in the call.

SECT. 26. Field Meetings shall be held at such times and places as the Field-meeting Committee may designate.

SECT. 27. The Board of Directors shall meet on the first and third Mondays of each month, at 7 o'clock, P. M., at the Rooms of the Institute, and at such other times as they may be called together by the President.

SECT. 28. Five members shall be a Quorum for holding any meeting of the Institute, or of the Board of Directors, but any less number, of whom the Secretary shall be one, may have power to adjourn the meeting.

SECT. 29. Officers shall be elected at the Annual Meeting, but vacancies may be filled by election at any Regular Meeting.

SECT. 30. All Elections shall be by ballot, and by a majority of the members present and voting.

ARTICLE VI.—DUTIES OF OFFICERS AND COMMITTEES.

SECTION 31. The President, or in his absence one of the Vice-Presidents, shall preside at all meetings of the Institute, and of the Board of Directors. The President shall be *ex officio* Chairman of the Finance Committee.

SECT. 32. The Secretary shall give notice of all meetings and record their proceedings; shall notify all members and officers of their election; shall have charge of all papers and documents relating to the general business of the Institute; shall conduct the general correspondence; and shall report the doings of the Institute during the year, at the Annual Meeting. He shall acknowledge the receipt of all donations except those to the Library. He shall record in a book kept for that special purpose the By-laws of the Society and the names of its members, with the date of their election, and whenever any alteration, amendment, or repeal of the By-laws is made, the same shall be entered in said book. He shall be *ex officio* Chairman of the Field-meeting Committee, and shall perform such other duties as the Board of Directors shall from time to time designate by vote.

SECT. 33. The Treasurer shall be *ex officio* a member of the Finance Committee, and shall keep an exact account of all his receipts and expenditures, and shall submit his report, after examination by the Auditor, at the Annual Meeting.

SECT. 34. The Auditor shall audit all accounts of the Treasurer, Curators and Committees, and shall report at the Annual Meeting.

SECT. 35. The Librarian shall be *ex officio* a member of the Library Committee. He shall receive, and have the custody of, all books and other printed works, maps, charts, and diagrams of the Institute; shall attend to their arrangement, cataloguing and preservation; shall conduct the correspondence relating to the Library and acknowledge all

donations thereto; and shall report on its condition at the Annual Meeting.

SECT. 86. The Library Committee shall divide the books, and other articles, belonging to the Library, into two classes; namely, (A) those which are not to be removed from the building, except upon the written permission of the Library Committee; (B) those which may circulate under such rules as may be prepared by the Library Committee, and approved by the Board of Directors, which rules shall have the force of by-laws. A copy thereof shall be pasted on the cover of each volume.

SECT. 87. The Board of Directors shall have full power to transact all the general business of the Institute, except the election of members and officers; and may, when they deem it best, refer any matter to the general meeting of the Society for its action. They shall decide, subject to the control of the Society, how and when the general resources of the Society, not devoted to any particular department, shall be expended; and shall assign all space or location of specimens for each Department, and shall determine all questions that may arise between any of the Curators.

SECT. 88. The Curators shall have charge of their respective Departments, and shall have full power relating to the collection, care and preservation of the specimens or materials relating thereto: provided, however, that any alteration of the general plan or principle of arrangement of any department and the removal of specimens or other material except for the purpose of exchange, shall be made only with the consent of the Board of Directors, or under such regulations as they may, from time to time, prescribe. Curators shall have charge of all Lectures, Exhibitions, or Entertainments, given for their respective Departments. All moneys or funds that may at any time be raised by any Curator, or that may come into his hands for the benefit of his Department, and the net proceeds of any Lecture, Exhibition or Entertainment under his charge, shall be deposited by him with the Treasurer, who shall give him a receipt therefor, and place the amount to the credit of that Department. Each Curator shall have authority to draw upon the Treasurer from time to time, for the purposes of his Department, to the amount standing to its credit; excepting, however, such funds as may be permanently invested, of which the income only, shall be subject to such authority. Each Curator shall report on the condition and wants of his Department, at the Annual Meeting.

ARTICLE VII. — ASSESSMENTS.

SECTION 39. An assessment of three dollars shall be paid by every member on admission, and annually thereafter on the third Monday in May.

SECT. 40. No member who shall be in arrears for one year shall be entitled to vote or hold any office; and any member so in arrears, who shall refuse or neglect to pay his dues for six months after being notified thereof by the Treasurer, by written notice duly recorded, shall cease to be a member of the Institute. *Provided*, however, that any member may, in lieu of the annual assessment, pay the sum of *thirty dollars*, to be added to the funds of the Institute, the annual interest thereof to be considered as the payment of the annual assessment of said member.

SECT. 41. Members elected more than four months, and within eight months after an Annual Meeting, shall have one dollar deducted from the next annual assessment; and members elected eight months or more after an Annual Meeting, shall have two dollars deducted from the next annual assessment.

SECT. 42. The President and Treasurer may exempt members from assessments, when they may deem it for the interest of the Society.

ARTICLE VIII. — APPROPRIATIONS.

SECTION 43. No Member, Officer, or Committee, except the Board of Directors, shall incur any debt whatever in the name of the Institute; but whenever money shall be expended under any appropriation, an account of receipts and expenditures, with the vouchers therefor, shall be rendered to the Treasurer by the party having the same in charge, and the net receipts, if any, shall be paid into the Treasury within thirty days after the object for which the appropriation was made shall have been accomplished.

SECT. 44. When no appropriation shall have been made, a statement of all receipts and expenses incurred shall be made to the Treasurer in like manner; and when all bills shall have been paid, the net receipts shall be turned over to the Treasurer, unless it have been otherwise previously ordered by the Board of Directors. The Board of Directors may, in either case above named, in the name of the Institute, assume all liability for any such debt as may be outstanding, when the balance of said receipts shall have been placed in the Treasurer's hands; provided they are satisfied that the gross receipts exceed all expenses incurred by the party in charge, and that the business or entertainment has been previously authorized by the Institute or the Board of Directors.

ARTICLE IX. — ROOMS.

SECTION 45. The Rooms shall be open to members and the public at such times and under such regulations as the Directors may determine.

SECT. 46. Visitors may be introduced by any member.

ARTICLE X. — AMENDMENT OR ALTERATION OF BY-LAWS.

SECTION 47. The By-laws may be altered, repealed or amended by the votes of two-thirds of the members present and voting, at a Regular Meeting, notice of the proposed alteration, repeal or amendment, having been given in writing at a previous Regular Meeting.

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* Extra Copies from the Proceedings and Historical Collections and Bulletin.

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ESSEX INSTITUTE,

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BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 9. SALEM, JAN., FEB., MAR., 1877. Nos. 1, 2, 3.

REGULAR MEETING, MONDAY, JANUARY 1, 1877.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records read.

The PRESIDENT stated that the occurrence of this meeting on the evening of the first day of the year, suggested the propriety of omitting the customary duties, and of devoting the time to the consideration of the results, and the influence on the cause of education and social culture, of the leading commemorations of the centennial year now closed. The principal and all absorbing event was the Centennial International Exhibition at Philadelphia, which was opened on Wednesday, the tenth of May, and closed on Friday, the tenth of November, the President of the United States, members of his Cabinet, and other distinguished individuals being present on both of these occasions.

The interest that has been given to this exhibition by the Institute claims a passing notice.

The early part of the last year, and the closing of the one preceding, were marked by an earnest effort of the

ladies of Salem to raise a fund to this end. Recourse was had to several available means. The most prominent was the Exhibition of Antique Relics in these rooms, in December, 1875, which was opened for several days and excited great attention. The display of articles was large, and the arrangement in good taste, illustrating the furniture, household utensils, and costumes of the several epochs in our history; also portraits and miniatures of several of those who in their day and generation acted well their part in the great drama of life. This was a financial success. Later in the season, after a lapse of a few months, a series of photographs, specially taken for this purpose, with letter-press accompaniment, "An Exhibit of Salem," its houses, industries, public buildings, and other noteworthy views and objects, were arranged • in a portfolio, and contributed to the Massachusetts Educational Department in the Main Building, where it elicited many commendations. The expense was defrayed by the Ladies' Centennial Committee of Salem.

About the same time the Institute, aided by several friends, contributed a series of articles, including portraits, dresses, old papers, documents, and photographs illustrating the period of settlement of Salem, to be placed in the Historical Department of the Exhibition, which was arranged in rooms in the Philadelphia Academy of Fine Arts.

At the close of the exhibition, through the kindness of our associate, Hon. J. Leonard Hammond, one of the Chinese Commissioners, the Institute received a large and valuable collection of Chinese drugs, specimens of paper, cloth, tools, and other material illustrative of Chinese life. Also many photographs, catalogues, and other papers from the officials connected with the other commissions.

Four excursions were arranged to Philadelphia; thereby

some 250 persons, members and friends of the Institute, were enabled to visit the exhibition under very favorable conditions.

The President alluded to the coincidence that this centennial year was also the 250th anniversary of the settlement of Salem by Roger Conant and his companions, an event well worthy of our notice, and concluded by announcing that he should call upon Hon. G. B. Loring, the Massachusetts Commissioner, and Rev. Messrs. E. S. Atwood and E. C. Bolles, to address the meeting upon topics suggested by the occasion.

REMARKS OF THE HON. GEORGE B. LORING.

MR. PRESIDENT:—The scope of the work assigned me since I reached this hall is somewhat startling. I did not anticipate being called upon to open the discourse of the evening, and I certainly had no expectation of being asked to give an extended and elaborate account of the proceedings of the Commission in whose hands the work of conducting the Centennial International Exhibition at Philadelphia in 1876 was placed, and in whose deliberations I took part from 1872 to the close of the great event, as the representative of the Commonwealth of Massachusetts. The details of that work would be by no means interesting to an audience like this, and on an occasion when we have met for congratulation and rejoicing rather than for investigation or instruction. It was as a striking representation of the progress of the American people during the last century that the Exhibition was full of interest and importance, and not merely as an example of careful and successful detail in managing such an enterprise; and it is for such significance and meaning as this that it is entitled to the admiration of the world, and to the special attention of an institution like that

which you represent. The highly creditable part performed there by the Essex Institute, exhibiting as it did the most interesting collection of historical matter prepared for that occasion, has connected it intimately with this first centennial celebration of the birth of the American nationality, and renders it peculiarly appropriate that the meaning of the celebration should be carefully considered in this place and at this time.

The universal desire of the American people to celebrate in a suitable manner the declaration of their national existence was a natural and proper impulse. However interesting may be the ordinary current of life to the careful observer, it is to the striking and startling events that we owe the great attraction of human history, and it is upon them that we depend for the inspiring force which makes man's career in the past attractive, and in the present and future strong and vital and effective. The history which we love, and from which we draw our lessons, is the record of the startling and surprising events which lie along man's pathway in the world. It is indeed the surprises which we love, and it is by the surprises that we make our great strides towards accomplishment and perfection. Man prides himself on his deliberate wisdom, and on his power of accomplishing a great end by calm purpose and by high design. But his great deeds are too often unpremeditated, his great thoughts too often unexpected, his great achievements too often unprepared, for him to boast of his power, or to forget that to an unexpected accident he often owes more than to carefully organized intention. To the surprising and brilliant results of great conflicts, unforeseen and unthought of, to the sharp turns in diplomacy, to the sudden establishment and growth of national existence, we owe the charms of national and popular record. To the unexpected burst of

sunlight upon a difficult problem in science we owe some of the most remarkable inventions. The great discoveries have astonished even the discoverers themselves. Newton, upon whose mind the law of gravitation was suddenly impressed by the most trivial accident; Morton, whose discovery of anæsthesia, for which he and he alone is entitled to the gratitude of man in all coming time, could have told a delighted and startled world how even to themselves the rising of the great curtain when the mysteries were revealed, was an event full of surprising joy. The marked incidents in science, in history, in art, in every day life, are the surprises which attract and charm us, and the startling steps which man takes in his advancement. The world is full of people,—the history of the world is full of striking events; but while the steady current of commonplace flows calmly on, the great surprises attract, and develop, and form, and create, and instruct. The ordinary course of national life has its lesson and its accomplishment; but it is out of an unusual and unexpected uprising that the world receives its greatest impulse. The nation whose career is anticipated and steady from step to step may be useful and powerful; it is the nation whose birth is a significant surprise, and whose course is full of new vigor and new experiment, which fills the heart of man with hope and promise, and his mind with progressive thought and design.

We have been told by one of our acutest thinkers that the American nationality is a phenomenon, an unexplained curiosity; to my view sir, it is a surprise, entitled to the same high rank in the history of civil endeavor, that is accorded to great discoveries in the records of science. In its colonial settlement and organization, in the process by which it secured its foothold on this continent, in its preliminary endeavor, in its birth and in its growth and

experience, the American nationality is an unparalleled and unrivalled surprise, and as such holds its place in history, not as an eccentric phenomenon, not as a doubtful curiosity. Its settlement was by no means imposing. A few bands of unsuccessful adventurers, a chartered land-company, a feeble and flying body of dissenters, compose the fundamental elements of our national birth to the casual observer. The planting of the great universal principle of our republic was unobserved, its existence was almost unknown and unheeded for a century. The passage of the May Flower to these shores was an event of so little importance at the period of its occurrence that it hardly received the notice equivalent in our day to a paragraph in a weekly newspaper. Jamestown furnished but small attractions as an event to the thoughtful men of its times. He would have been looked upon as wild and visionary, who had congratulated John Carver and John Smith, and John Winthrop, and John Endicott that they were laying the foundations of a great overshadowing empire whose majesty should be upheld by the might and dignity of a free and educated people. The century however which followed this simple and obscure work, witnessed the most remarkable growth of all the fundamental and preliminary work of national establishment and development which the world has ever witnessed. In these rapidly rolling hundred years the scattered and struggling people of the American colonies, accomplished what had before been done only in almost as many centuries. The long period of preliminary life during which England was toiling on to a position worthy of national recognition—a period whose beginning is lost to us in darkness and gloom—was as familiar to our fathers as their own contemporaneous history. They knew that during a hundred generations of men, the nations of

antiquity struggled to emerge from darkness into light—and often struggled in vain. The weary and gloomy way travelled by France and Spain and Italy, before they had risen high enough in arts or arms or culture or power to entitle them to national recognition, they did not forget. And directed as they were by the best principles of government laid down in the past, strong in that remote isolation which protected them against all foreign interference, feeling the weight of responsibility which rested upon them as the founders of a new empire on whose success depended their own welfare and almost their own existence, they advanced with a vigor unknown before in the business of laying the foundations of the great social and civil temple which they and their children were destined to erect. In a century and a half the great preparatory work was accomplished. Our foothold as a nation was established on this continent. Our position was confirmed. We had a record of war of which the most martial people might be proud. We had thought out great problems of state; had solved to our satisfaction some of the most difficult questions of theology; had surrounded ourselves with the comforts and luxuries of life; had developed a civilization as high as any known on earth; and had perfected a social and civil organization whose health and strength arrested the attention of the thoughtful as a surprise, and are as superior to the eccentric and unusual operation of a phenomenon or a curiosity, as the grand march of the stars in their courses, is more majestic than the erratic career of a meteor flashing across a midnight sky.

Brought then as we were through this amazing period of vigorous infancy, we proclaimed to the astonished world that the life of a nation had begun, and so proclaimed it, that the declaration marks a period of time as

distinctly and unequivocally as does the rising of the sun or the going down of the same. To the United States, the American Republic, is it given of all nations to so date the hour of its birth as to celebrate its Centennial Anniversary. To us alone belongs that one initial event in history, so important, so accepted, so recognized, as to fix the time when a nation was born, and mark the hour when all the career of greatness began. Can this be said of any other? The significance and promise of the Declaration of our Independence, crowned with the accomplishment of the first century of national life, constitute a chapter in history which entitles us to the admiration of the world, and gives entire propriety to an international jubilee on our own soil. Summon before you the other nations of the earth, and where in all their annals will you find an event like this? Shall England be called on to celebrate the invasion of William the Conqueror, or the beheading of Charles I, or the restoration, as events out of which her very existence sprang? Shall France be expected to fix her International Exhibition upon the centennial year of the great revolution, or upon the promulgation of the Code Napoleon, or upon the return of the Bourbon, as the date of her national power and glory? The event is ours and ours alone; and we may never grow weary of contemplating that "brilliant and happy moment," when full armed the American people sprang into existence, and gave promise of what a hundred years might bring forth. I call this a surprise in history. It was a surprise to those who witnessed the event, it is a surprise to us who contemplate it. Not readily has its full significance been understood even by ourselves. By long-continued and persistent endeavor alone, have our minds been brought to a thorough understanding of the true intent and meaning of an international interchange

of thought and experience, and accomplishment, illustrating what has been done and said on our soil during the last hundred years. To our people, to Congress, to those who rule over us, the event appeared only as a holiday sport. To us who look back upon it, it stands out as the world's rejoicing over the progress of a free people in all those mental and material accomplishments, which constitute so much of national greatness. And I doubt not we shall date from it another century of progress and development, in which all our hopes, as sons of our colonial and revolutionary sires, will be more than fulfilled.

I cannot discharge my duty at this time with any degree of satisfaction to myself, or with any measure of justice to the event which has called us together, without allusion to the vital and inspiring force which gave unwonted strength to our infancy and vigor to our growth into manhood. Our very existence as a nation was the outgrowth of most earnest purpose, and most lofty thought and conviction. We turn back to this with gratitude and pride. Our fathers brought with them all the fundamental principles upon which they could build the structure of society,—a church upon freedom of conscience, a state upon the sacredness of individual rights,—and they proceeded to build wisely and well. Their theories were the matured thought of centuries. "Nothing came from Europe but a free people," says Bancroft. They came with the doctrine of suffrage and self-government thoroughly infused into their minds. They took their rulers from the ranks; and they who elected John Carver as the first governor of their colony, stand out conspicuous as those who taught the people how to govern themselves. They had been taught to believe the truths laid down in Magna Charta, and they read in its immortal lines, that a free people were entitled to a representative government, and that

"the regal authority could not suspend the execution of laws, except by the consent of Parliament." They had learned that great law of the State, which, in 1640, Pym laid down when he spoke for the privileges belonging to the high court of Parliament, and which Lord Kenyon still later announced, when he claimed that the Houses of Parliament protected the liberties of England. It was doctrines like these, which were brought to these shores not by the ignorant and adventurous, but by the wisest and most thoughtful scholars of that age, by the graduates of Oxford and Cambridge, by those who brought from the banks of the Cam and the Iris that free and independent culture which for more than two centuries has made the banks of the Charles as sacred in the New World as those classic rivers are in the Old. The principles of free government, which the Englishman had proclaimed for generations, against the overshadowing power of the throne, and which had served in his native land as the vital force of a revolution, found here a genial soil, and became at once, in the entire absence of all civil organization, the strongest and most useful system in the land. Not then as theorists, not as investigators, not as mere inquirers, but as the custodians of a mature and well organized system, did the colonists commence and carry on their work. They were the heirs of careful culture, powerful intellects, and firm and defiant will. They had been taught in the best schools of industry and enterprise. They were good merchants, good mechanics, good farmers, good manufacturers, in a homely fashion. They were thoughtful theologians, and laid down the plan of salvation with as much definiteness and method as they fixed the boundary lines of their possessions and planted their sacred land-marks. They were neither crude nor inex-

perienced. Let no man suppose that they entered blindly upon their work. They advanced to their duties with perfect understanding, and with a well-defined purpose and strong determination. For a century and a half they gathered all knowledge together, which might guide them in their labors. And when the business of organizing a new government came upon them they found their minds fully enlightened for the great occasion. It is not surprising that at the end of the first century of their national existence, a people thus prepared in the beginning should have exhibited a degree of maturity in all the affairs of life which filled the minds of older nations with astonishment. It is not surprising that in all material endeavor such a people should excel. It is not surprising that the product of American ingenuity and skill should have arrested the attraction of the world, at the International Exhibition, and that in arts, in literature, in machinery, in manufactures, in the general management of the Exhibition itself, the American people should have proved a powerful rival in the great world-wide competition. The appeal here is constantly to the wisdom of the people—to that wise instinct which education and responsibility for many generations, have made a ruling characteristic in the American mind, and which has thus far been equal to all necessities, and has guided us through every trial which has hitherto shut down with threatening danger upon the republic.

In this Great Exhibition, Massachusetts, I am happy to say, performed her part well. She stood foremost in the products of her industry and skill. Her educational system was admired by the careful observer and scholar. Her historical exhibit, thanks to this institute, was entirely worthy of her radiant record. Her building, erected by the liberality of her citizens, and designed by me as the

Massachusetts Commissioner for the accommodation and entertainment of the people of our state, was the admired resort of multitudes from all quarters of the Union. To myself, as I am sure it is to you, the record of our Commonwealth on this centennial occasion, is a source of pride, and satisfaction. I trust the new era upon which she has now entered, will be still more radiant than the past, and that she may advance in moral excellence, in intellectual culture, in material prosperity, until the desires of the fathers are all fulfilled, and the law of national life laid down by them shall be supreme among the nations of the earth.

Rev. Mr. Atwood then addressed the meeting :

I am reminded that there are elsewhere than in history surprises, changes from high to low, from low to high. We were notified that we were to have a double subject, the outcome of the Centennial year, and the Centennial Exhibition. We have had plenty of fireworks, and I do not know how much will come out of it. The foreigners must have got the impression that we have not abated in our self esteem. If we are so great as a people no one knows it so well as ourselves. One of the ablest of the modern English thinkers said to me there was nothing that startled him so much as the journalism of our country, and among other things the newspaper accounts of the great Exhibition at Philadelphia. It would have been a vast exhibition anywhere. I saw that at Sydenham, that at New York, and that at Paris ; but all together were not so great in space as this. It was indeed a surprise in consideration of the newness of our country.

I have heard some people, since its close, argue that it was a very foolish undertaking, that it was too expensive, etc. I believe one newspaper (in Rutland?) com-

plained that it had been a great damage to their town, so many people had gone from there to see it; that fifty thousand dollars were spent by their people *outside of the town*. I need not take the trouble to argue the folly of such a proposition. The simple contact with the people of foreign countries was a great benefit to us. The Exhibition was an industrial school for the whole people. A party of men or women who could go through those buildings without having their minds instructed would be an anomaly and a wonder.

What interested me most was the effect which this exhibition was to have upon the standing of our country in the estimation of the world. Our calicoes, for instance, are preferred over those of England. We already have begun to reap practical results in the effect upon our exports. Some of you have doubtless seen that speech of the most noted of the Swiss watchmakers. He found a case of Waltham watches at Philadelphia and borrowed one of an inferior grade. Upon examination of it he declares to the Swiss people that there is not in Switzerland a manufactory that could produce such a watch. I have been informed by one firm that their exhibit at Philadelphia has been of untold value to them in their business.

We had there also the evidence of the progress of art-culture in America. Of the visitors, nine out of ten have preferred devoting their time to the Art Gallery. When the French artists made up their exhibit to send here, they collected nothing but second and third-rate art pictures. It so happened that in coming over some of these pictures became somewhat mouldy. It was reported in Paris that our people, when the pictures arrived, were so in despair with envy that they bespattered them with mud.

As an instance of the natural taste and judgment of

our people it may be mentioned that the best pictures attracted the most attention. The "Railway Station" was found out at once, and admired, although the spectators did not know that the painter was a master artist.

Another thing to be considered is the increased value that will be put upon brain labor. The great industrial interests have hitherto been favored, and have been the source of wealth. Science has not had so much opportunity, as witness the difficulties that even Agassiz had to contend with. The highest processes, the refinements of the ceramic art, are more valued. There is more appreciation of the worth of the intellect as a power in society.

The contrast there exhibited between the results of free labor and of slave labor was remarkable. Where were the Gulf States in the Exhibition? The only things to be seen there from the Southern States were the work of the freedmen. Mexico, Brazil, entirely overshadowed the South.

The results of missionary labors were evidenced in many things. In the Chinese Department were books published directly or indirectly through that influence. Religious thought has borne its fruit.

The outcome of all this must be a wonderful impulse to immigration of the best characters. English and French skilled workmen, seeing what America is doing, what are the prices for labor and the opportunities for employment, must be more than ever induced to come here. This of itself will pay for all.

Finally, the good behavior of the visitors at the Exhibition, and the order and propriety of conduct of all in attendance, were worthy of the highest commendation.

Rev. Mr. BOLLES, being called upon, spoke as follows :

I feel both pleasure and regret on rising to say the last word to-night. The gentlemen who have already spoken have had, as they deserved, our close attention ; but in one way and another they have so covered the field of discourse assigned to me that my own remarks seem superfluous. I may also express the thought that the list of topics should not have ended here. It would have been pleasant and profitable to us to hear Prof. Hagar on the educational, or Prof. Morse on the scientific, results of the Centennial Exhibition.

The addresses to which we have listened have done no injustice to the part of the United States itself in the honors of the Exhibition. But perhaps even the great American people will be modest enough to confess that it had something to learn there from less inventive and rapid foreigners. It should especially have had such a feeling toward the Art-displays of other nations. You have heard that France and Germany were discourteous enough to send us, as to an ignorant and uncritical land, only their second-rate works of art. But England did not scamp her work in the Art-Building ; nor did China and Japan neglect to do their best. To England in particular we owe a debt of gratitude. Beside our century of accomplishment in practical science and invention, she placed her last hundred years of art. She asked, "What have my painters done from 1776 to 1876? Who have they been, and where can I find characteristic canvases of each?" And she generously placed on view at Philadelphia, what was the illustrated history of this century of her growth in Art. It must have been in a spirit of genuine enthusiasm and friendship that the Queen and the noble owners of these paintings were willing to expose them to the

dangers of the voyage, that we might see, in even a more complete collection than can be found in any one gallery in Great Britain, the record of what England has been doing in Art since we left the old leading strings of her rule. There were paintings there which travellers remember to be cherished beyond price as examples of their peculiar style in the country to which they belong. And one could learn at Philadelphia those things concerning British Art, which would require much studying and journeying over sea to understand as well.

Nor can we easily discharge our obligation to China and Japan. What marvellous things they showed us in porcelain and bronze! Macaulay, in the third volume of his History, sneers at the fancy for Chinese ware which Queen Mary introduced at Hampton Court, as a "frivolous and inelegant fashion." But Miss Martineau, in her later History, shows that this love of Oriental art did not then have more than a limited range or existence, since she alludes to the Chinese productions to be seen in the early part of this century, in the homes of our Salem merchants, as one of the things talked about by those who were earnest for the free opening of the Eastern seas for trade. They wanted Oriental objects, Art-objects among the rest, more common; and Philadelphia showed us how vast were the resources of those nations so recently joined to the western world by the bands of commerce. I understood that the most ancient and precious things in the Chinese Court were to return to China, as they were the property of wealthy *connoisseurs*, and worth more at home than here; but the readiness with which the rest, even the most expensive, were sold, illustrated the increasing Art-culture of our own people. It is neither frivolous nor inelegant to admire those works; and after the passion of the day has thrown off a few of its bubbles, we may look

for a steady and intelligent demand for the rich colors and exquisite materials which the far East sends us.

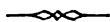
It is well known that the most popular exhibits at Philadelphia were those in Art, and that the most constantly crowded building was Memorial Hall. The throng of sight seers was of course largely made up of those to whom the meaning of a picture or statue was as a Greek letter, and many were the odd speeches and queer mistakes which were noted among them. One spectator interpreted the enormous and unpleasant picture of "Rizpah" to be the "Goddess of Liberty scaring away the American Eagle from the vanquished South." Another stopped in the Russian Court before a fine work in *repoussé* silver, which represented figures in violent action. "R-e-p-o-s-e," she slowly read it; "there don't seem to be much *repose* about that!" A man and his wife were examining the malachites in the same section. "They are beautiful, Charles, these *amalekites*, are they not?" "No, my dear," he answered, proud of his superior knowledge, "not *amalekites*, but *amalgamites*!" Still the people saw and enjoyed all these things; and unless they are more obtuse than the last century seems to have made them, they must have gained a vast amount of instruction from their visit.

Our household art, in particular, must be very much advanced as one result of the Exhibition. It is not so very long ago that England, which had so much to teach us in this department at Philadelphia, was herself a scholar to the older art of the continent. In the brief lull of the war with the first Napoleon there was a great rush of English visitors to France; and when hostilities suddenly recommenced, it is said that twelve thousand of them were caught and kept in Paris. They brought back new tastes and refinements; and English Art from that

day made a striking advance. But Art in Great Britain owes most perhaps to Prince Albert. It has been the fashion to decry him as only the imported husband of a queen. But he brought to England a delicate and graceful culture and a generous patronage of Art, which did much to give a beautiful drapery to the rugged English life, just as the ivy makes her old gray walls more picturesque. We should not forget that he was the originator of the Great Exhibition of 1851 in Hyde Park, where his Memorial now stands; and in consequence he may be considered in close relation to all the International Expositions which have followed; in some sense, indeed, the cause and suggestion of ours in 1876. The original Crystal Palace still remains, the attraction of holiday visitors to Sydenham; and in the London International of 1874, more than four thousand pictures were on the walls. And one result of this culture of Art has been to make the English home more beautiful. The exhibits of Minton's tiles, Daniell's porcelains, Elkington's electrotypes, Doulton & Watts' ceramics, showed us this; while the buildings of the English Commissioners, with their simple but effective decorations, were a pleasure and surprise to all who were fortunate enough to gain admittance. Long before the close of the Exhibition, Doulton & Watts' entire display of fire-place and wall ornaments was sold; and each one will become a missionary of Art in some corner of our land. No one could have failed to see how the strong home instinct of the English race entwined itself with new art in the production of those charming fireplaces which were such attractive centers for admiration at our Exhibition. They were copied many times in prints and photographs; and many were the remarks made about the beauty which a genuine New England wood fire would have in them, a grace which in

Old England they could seldom know. Now the English did not imitate all this slavishly from other nations; they made an art for themselves and their own homes. Once on the road to apply art principles they found their inspiration and their models in the scenery and life of their own land.

I believe that this Exhibition will give exactly the needed impulse and direction to American Art. We ought to realize our privilege—to incorporate with the vigorous and successful life of our republic the refining and helpful influences which Art culture can give. But we must have education for this. We must see and know what others have done, and then transmute foreign Art into that which shall be characteristic of America. Then over the centuries to come will bend this serene sky of Art, in which more than one shining star shall bear our national name.



TUESDAY, JANUARY 9, 1877.

MAJOR J. W. POWELL, the U. S. Geologist in charge of the Exploration and Survey of the Colorado Region, gave an interesting lecture on the North American Indians, with whom he has an extensive acquaintance and of whose philosophy and myths he has made an especial study. He alluded to their ideas of creation, their Gods, their religion, their mythology and their tales, interspersing his remarks with many impressive incidents and Indian stories.



MONDAY, JANUARY 15, 1877.

MAJOR J. W. POWELL gave this evening the second

lecture in the Institute course. The subject was "The Cañons of the Colorado." The lecturer spoke of his exploring expedition in that wild, uninhabitable region of the Rocky Mountains, undertaken at the request of the Government, and briefly described the natural features and scenery of the country, which are grand rather than beautiful. The valley of the Rio Colorado is a vast natural bed of rock, mostly bare of vegetation, a mile in thickness, and covering as large a surface as the whole of New England and the Middle States combined. He concluded the lecture in narrating the adventures of his party in their perilous but romantic voyage down the river. This was accomplished through great hardships and without any fatal accident, though they had many narrow escapes with their lives, and three of his men who deserted in the face of great danger were captured and killed by the Indians. The lecture was profusely illustrated with views of the scenery on the Colorado, including its principal cañons and cataracts, by the calcium light.

MONDAY, JANUARY 29, 1877.

PROF. HENRY CARMICHAEL, of Bowdoin College, favored the Institute with an instructive lecture on "Flame," which was fully illustrated by experiments that were singularly successful, though he was removed from the special facilities of the laboratory. The more prominent of these were the placing of phosphorus and gunpowder in the interior of the flame, the musical and sensitive flame, the effect of various chemicals upon the color of a flame, and the monochromatic flame, which gave to everything a ghastly and cadaverous appearance.

REGULAR MEETING, MONDAY, FEBRUARY 5, 1877.

MEETING this evening. The PRESIDENT in the chair.
Records read.

P. P. Bielby and George A. Purbeck, both of Salem, were elected resident members.

J. W. Powell of Washington, D. C., G. W. Levette of Indianapolis, Ind., and Benjamin J. Lang of Boston, were elected corresponding members.



MONDAY EVENING, FEBRUARY 12, 1877.

LECTURE ON THE TELEPHONE.

THE evening was devoted to a lecture on the telephone by Prof. ALEXANDER GRAHAM BELL, being one of the Institute course of lectures. The meeting was held at the Lyceum Hall for the purpose of more easy connection with telegraphic lines. It was the first public exhibition of the telephone invented by Prof. Bell, and the experiments were eminently successful, and were greeted with enthusiastic applause by an audience which completely filled the hall. A wire of the Atlantic and Pacific Telegraph Co. was placed at the disposal of Prof. Bell, and was connected with the Lyceum Hall in Salem, and with the office in Exeter Place, Boston, where were present Mr. Thomas A. Watson of Salem, the Professor's assistant, and Messrs. B. Bridden, the electrician, Prof. E. B. Warman, and A. B. Fletcher of the "Boston Globe."

The President, Dr. WHEATLAND, introduced Prof. Bell, who opened his lecture with an allusion to the pleasure it gave him to exhibit the Telephone for the first time before a public audience, here at Salem; not only on

account of its being the place of his residence and where he had conducted his experiments for some years, but because it was here that the science of Telephony had its rise. The first attempt to produce musical sounds by electric currents was by Prof. C. G. Page,¹ a Salem man, who discovered, in 1837, that whenever a magnet was affected by an intermittent current a sound was transmitted. This led observers in all parts of the world to take up the subject. The discovery was also made by Prof. Page that whenever a current is passed through a coil a sound is emitted by the iron surrounded by the coil. It had been imagined that a molecule of iron had changed its place. Prof. Page reasoned in this way:—if we can make this sound rapidly we shall have a musical note; and this can be done by making and breaking the circuit. These suggestions excited a great deal of attention abroad.

Reis constructed a telephone by which a musical note was produced, by making and breaking circuit, in an iron core surrounded by a coil. By singing into a transmitting instrument a membrane is made to vibrate, thereby producing the musical sound by intermittent contact with the vibrating medium. Reis' telephone has never been brought into practical use. It is a very beautiful instrument, theoretically, but it gives merely the pitch and nothing more.

¹ Charles Grafton Page, son of Capt. Jere. L. & Lucy D. (Lang) Page, born in Salem, Mass., Jan. 25, 1812, prepared for college in the Grammar School, Salem, under the charge of Theodore Eames, entered Harvard College in 1828, graduating in 1832, studied medicine with Dr. A. L. Peirson of Salem, and the Harvard Medical School, receiving the degree of M. D. in 1836. In 1838 he went to Virginia and practised his profession two years. In 1840 he was called to a position in the U. S. Patent Office and was one of the Examiners from that time until his death, which occurred at Washington on Tuesday, May 5, 1868.

In early youth he developed a taste for the study of electricity and the kindred sciences, and continued through life a diligent and successful student in these fields of observation and enquiry. He was a frequent contributor to "Silliman's Journal of Science," and was the author of several treatises on the subject of electrical science and discovery. In 1839-40 he was Professor of Chemistry in Columbia College, D. C.

I have followed out the experiments of Page and of Reis. All investigators have followed the idea of Page. I found that his theory of the cause of the sound was a mistake. An empty coil will produce the same effect. When you pass a current of electricity intermittently through an empty coil musical notes are emitted. When passed through a lead pencil a very pleasing note was emitted through the plumbago; also through an iron wire, and curious results are caused by induced electricity through the fore arm.

In the course of experiments by a number of persons joining hands with Ruhmkorff's coil a sound from the clasped hands was produced. Whenever the current through the persons joining hands was made or broken, a sound was produced. A piece of paper placed between the hands produced a still more curious effect.

These are effects produced *directly* by the currents of electricity. Still more interesting effects are produced by placing an iron coil *near* the magnet; by placing it nearer and nearer, the sound is louder and louder. This happens from every piece of iron placed near the magnet, and the effect is still greater when it is expanded into a thin membrane.

I hope I shall be able to exhibit some of these effects to-night. This, however, is the first attempt to do this before an audience, and it is possible the experiments may not succeed so well as I desire. The first thing is the production of a musical note in the way I have first described by intermittent currents. My friend, Mr. Thomas A. Watson, is at this moment creating an intermittent current in Boston. [Loud and distinct sounds, followed by an audible message, are heard.]

I believe I am the first person who has adopted the practice of using a metal diaphragm in the telephone.

Also I have discovered that a telegraphic message may be sent by means of using musical notes. Some of these discoveries which I have described were made simultaneously by three persons: Ward of Chicago, Lecourt, and myself.

All the entanglements of sound come through the air. We perceive all the varying tones, etc., without difficulty. Prof. Wheatstone and afterwards Prof. Henry demonstrated the fact that a solid substance, for instance a wooden rod or bar, would conduct an infinite number of vibrations simultaneously. Pianos on the opposite sides of a street may thus be made to answer to each other. The same effect may be produced in a wire also by the use of the battery. You can send as many musical notes as you please along a wire by using the means I have described.

I shall ask Mr. Watson to send two sounds at once. [*One sound heard.*] The notes are not simultaneous. The trouble is Mr. Watson is repeating the first experiment, through my mistake in sending the wrong signal.

[An intermittent current was then sent from Boston by Mr. Thomas A. Watson, Professor Bell's associate. This caused a noise from the telephone very similar to that of a horn. The Morse telegraph alphabet was then sent by musical sounds, and could be heard throughout the hall. The audience burst into loud applause at this experiment. A telephonic organ was then put into operation in Boston. "Should Auld Acquaintance be Forgot," "America," and "Yankee Doodle" were readily heard through the hall and heartily recognized. At this point Prof. Bell then explained how he learned to transmit the tones of the human voice, and paid a grateful tribute to Mr. Watson. Prof. Bell asked Mr. Watson for a song, and "Auld Lang Syne" came from the mouthpiece of the instrument almost before his words were ended. Mr.

Watson was then asked to make a speech to the audience. He expressed himself as having more confidence eighteen miles away than if he were present. His speech was as follows: "Ladies and gentlemen: it gives me great pleasure to be able to address you this evening, although I am in Boston and you in Salem." This could be heard thirty-five feet distant; that is, all over the hall, and brought down the house with applause. A system of questioning was then carried on and Mr. Watson was asked if he heard the applause. The answer was, "I was not listening. Try again." The applause was given and its receipt at once acknowledged in Boston.]

A number of musical notes can be sent simultaneously on the same circuit, which gives a great advantage. We did not get exactly the same effects as when the musical notes are heard in the air. The cause is not far to see; for in the intermittent current the vibrations are not in the exact ratio of the vibrations of the air.

Other experimenters have been trying, with myself, to bring to practical effect the principle of multiple electricity. I discovered that when a great number of intermittent currents were being transmitted one breaks while the other makes, so that there was really no break at all. There are six kinds of electrical current. [This subject was then further illustrated by the lecturer upon the blackboard; the different forms of the electrical wave; and the differences between positive and negative electricity; "direct" and "reversed" "intermittent, pulsatory and undulatory currents" were shown; and how the sound of musical notes may be produced by such currents together.]

The idea occurred to me of a new kind altogether, and that the current might be made to vary exactly as the air varies. [This idea was then further explained and illus-

trated by drawings on the board.] I used a common battery and instead of breaking the current I used a constant current, and a vibrating membrane. I found that by placing a membrane before the magnet and speaking before it, the sound was transmitted.

It was my good fortune to meet with another person interested in similar studies, Mr. Watson of Salem. It is chiefly due to his assistance that the invention is proceeding to a successful issue.

[The lecturer then explained the construction of the magneto-electric telephone on the blackboard.]

Though the sounds are at present feeble and heard with difficulty at a distance, I hope in the future to be able to have them more audible. Soft articulation is more intelligible than loud. A whisper is perfectly audible.

Messages have been transmitted through this instrument between Boston and Conway, a distance of 143 miles. I have passed the messages through the human body and through water, which has a million times more resisting power than a wire. The result of these experiments seemed to demonstrate that the resistance retarding the magneto-electric current was vastly less than the resistance to the galvanic current, and encouraged me to believe that it will, in time, be possible to converse across the Atlantic by means of international telephony. These experiments we are now conducting are made over a distance of twenty miles; and there is no battery, only a wire.

[Coughing and singing were then heard, and a variety of questions was then asked from the Salem end and among them: "What news from the Electoral Commission?" followed by the distinct answer of "I don't know of any." But the news came fleeting along that the engineers of the Boston and Maine Railroad had struck. General

Cogswell then asked if trains were running; the answer was clear and distinct that they were not at 5.30 o'clock. Prof. Bell introduced the Rev. E. C. Bolles, who said: "I shake hands with you cordially in imagination twenty miles away." The Rev. E. S. Atwood asked, "Does it rain?" "It does not in Boston," was Mr. Watson's answer. Prof. Gage, the electrician, then spoke through the telephone, endeavoring to have his voice recognized. This could not be done, as Mr. Watson was not familiar with the voice. Mr. Shuje Isawa was recognized, Mr. Watson being perfectly familiar with his tones. One of the assistants in Boston then said that "Hold the Fort" would be sung in Boston, and the tune which followed was readily recognized.] Prof. Bell closed his lecture by briefly stating the practical uses to which he was confident the telephone could be applied. Private dwellings may be connected with a central office, and messages transmitted by the voice. Merchants can conveniently transact their business by its aid. Hearty applause was afforded the lecturer as he finished, and people flocked about the stage in large numbers to more closely examine the wonderful instrument that had placed them in audible communication with people nearly twenty miles away.

The lecture and experiments were an unqualified success. Vice President Goodell of the Institute offered an order, which was adopted, to draft a series of resolutions to express the satisfaction of the Institute and audience for the instructive and interesting entertainment offered by Prof. Bell. A vote of thanks was also extended to Mr. Watson and sent to him by telephone. A vote of thanks was passed to the Atlantic and Pacific Telegraph Company for their kindness in allowing the use of their wires for these experiments. A vote of thanks was also tendered to Miss Molloy, operator of the Atlantic and

Pacific Telegraph Company at Salem, for her assistance during the evening. The telephone was then taken apart and explained to a few ladies and gentlemen, to their great wonder and satisfaction. A report of the meeting was transmitted to the "Boston Globe" by the telephone in the presence of about twenty, who have thus been witnesses to a feat never before attempted—that is, the sending of a newspaper dispatch over the space of eighteen miles by the human voice, and all this wonder being accomplished in a time not much longer than would be consumed in an ordinary conversation between two people in the same room.

The President appointed Rev. E. S. Atwood, Rev. E. C. Bolles, A. C. Goodell, Jr., D. B. Hagar, and Wm. D. Northend, as the committee to draft and report a series of resolutions as above.



MONDAY, FEBRUARY 19, 1877.

REGULAR meeting this evening. The PRESIDENT in the chair. Records read. Donations and correspondence announced.

Caroline Baldwin, of Salem, was elected a resident member.

Mr. JOHN McNEIL, of Winchester, formerly of Hillsborough, N. H., who has great interest in the restocking of the rivers and ponds of New England with fish, gave a familiar and instructive talk on artificial fish breeding and collateral topics. The people of Salem, who have an abundance of various excellent sea fishes at their very doors, do not, perhaps, appreciate the importance of the inland fisheries and the present efforts to restock with the

finny tribes the depleted rivers and ponds of the country, as do the residents of the interior, but they cannot help feeling an interest in the subject when presented as it was on this evening.

Mr. McNeil stated that a quarter of a century ago, two-thirds of the food,—beef, mutton, pork, etc.,—consumed in New England was produced in New England; now, the production has fallen to about one-third of the consumption. The fisheries have been nearly destroyed on the great rivers by the erection of factories and other causes, and the ponds have been in a large measure depopulated of their fishes; hence the necessity of restocking by artificial means, and the efforts of the Legislatures of the various States to encourage this purpose.

Mr. McNeil presented many interesting facts in relation to artificial fish-breeding, explained the process of spawning, hatching, transportation and restocking, and spoke most positively of the assurances of success resulting from the plans now in progress. He described the habits of fishes and spoke particularly of the lamprey eel, the alewives, the shad and the salmon, the four varieties of the most importance for the rivers; explained the fishways on the Merrimac and Connecticut, and gave an account of the success that had already been achieved on those rivers and of the hopeful promises for the future. In conclusion he stated that he should be glad to answer any inquiries that the audience might suggest, and several questions were asked and satisfactorily answered.

He had started from home with some eggs of the salmon, but they had hatched on the way and the young fishes were exhibited.

Mr. F. W. PUTNAM added some observations in regard to the lamprey eel, illustrating his remarks on the black-

board, and concluded by offering a vote of thanks to Mr. McNeil, in behalf of the Institute, for his interesting and instructive lecture, which was unanimously adopted.

A. C. GOODELL, Jr., Esq., in behalf of the Committee appointed on the previous Monday evening, reported the following resolutions in reference to Prof. Bell and the telephone, viz. :—

RESOLVED, That we tender our cordial thanks to Professor Alexander Graham Bell, and to his associate, Mr. Thomas Augustus Watson of Salem, for the wonderful and profoundly interesting experiments so successfully performed by them at Lyceum Hall on the evening of the 12th instant; and to the Atlantic and Pacific Telegraph Company, who generously permitted the use of their wires between Salem and Boston; and to Miss Anastasia L. Molloy, who operated the telegraph on that evening.

RESOLVED, That the experiments we have witnessed satisfactorily demonstrate the feasibility of conveying articulate sounds by means of magneto-electricity; and we find that this method possesses advantages over the ordinary electric telegraph in the following particulars:

First, in the simplicity and cheapness of the mechanism employed.

Second, in dispensing entirely with batteries.

Third, in avoiding the necessity of employing skilled operators.

Fourth, in the apparently great motive force of the magneto-electric current employed, and (according to the evidence exhibited by Prof. Bell) in the fact that resistance is, by this means, so far overcome or avoided as to encourage the belief that, practically, no difficulty may be expected, from that source, in the longest circuits.

Fifth, in the rapidity of communication by the telephone, and in the ease with which it insures accuracy by admitting of instantaneous vocal repetition from either end of a telephonic line.

RESOLVED, That the discovery that the vibrations of a conducting membrane or plate set in motion by the human voice can be so delicately and forcibly communicated to a corresponding membrane at the opposite end of an electric circuit, as to produce articulate sounds of exactly the same timbre, quality, pitch and relative strength, appears to us one of the most marvellous discoveries of the age; and the practical embodiment of this discovery, in the telephone, constitutes a most curious and remarkable invention; and we deem it especially noteworthy that these were not accidental, but the result of profound study of the science of acoustics, and a consequent inference that currents of electricity might be made to vary in intensity in the exact ratio that air varies in density when affected by sound.

RESOLVED, That we deem it a signal honor to have been privileged

to witness the first public operation of this wonderful instrument, at a meeting, a report of the proceedings of which was sent abroad as *the first public message by the telephone.*

RESOLVED. That we are gratified to learn that these experiments are to be repeated in Salem; and to them, as at once instructive and astonishing, we invite the attention of the public.

RESOLVED. That these resolutions be communicated to Prof. Bell and to Mr. Watson by the Secretary; and offered to the press.

The committee who reported these resolutions consisted of Rev. E. S. Atwood, Rev. E. C. Bolles, A. C. Goodell, Jr., D. B. Hagar, and Wm. D. Northend.

Before putting the question President Wheatland, after alluding to Prof. Bell's recognition of our late townsman, Dr. Page, as the discoverer of the transmission of sound by the electric current, related some very interesting reminiscences of his school and college classmate, Dr. Page, and of those other Salem gentlemen, the late Jonathan Webb, Thomas Cole and Francis Peabody, who had many years ago distinguished themselves by their investigations and experiments in relation to electricity and electro magnetism.

The resolutions were then unanimously adopted.

Mr. F. W. PUTNAM presented a communication entitled "Notes upon the Birds observed in Southern Illinois, between July 17 and September 4, 1875, by E. W. Nelson." Referred to the Publication Committee.

NOTES UPON BIRDS OBSERVED IN SOUTHERN ILLINOIS,
BETWEEN JULY 17 AND SEPTEMBER 4, 1875.

BY E. W. NELSON.

THE following observations were made during a collecting trip through the southern portion of the state at a season when but few species other than the summer residents were to be found. One of the main objects of the trip was to learn as far as possible what species were to be found in the southern extreme of the state during summer. For this purpose two main points were chosen. Mt. Carmel on the Wabash, and Cairo at the junction of the Ohio and Mississippi. From each of these places short trips were made into the elevated country away from the rivers, the results of which will be given in a supplementary list after each of the main lists.

Mt. Carmel and Vicinity.

The observations at this place extend over the entire time of our sojourn in Southern Illinois, as my companion, Mr. F. T. Jencks,—to whom I am indebted for many of the Mt. Carmel notes,—remained here during my trip to Cairo and vicinity.

At this place our collecting was mainly confined to the heavily wooded bottom-lands along the Wabash and White Rivers, with short excursions to the slightly hilly and well wooded country back of the town. This we found would scarcely repay us for our trouble, and our attention was turned to the rich fauna of the bottoms. Here in dense thickets about ponds and lagoons and especially in the undergrowth in portions of a cypress swamp on the White River, a few miles above the town, we found our most attractive field.

In such places *Protonotaria citrea*, *Helminthophaga ptnus*, *Dendroica caerulea*, *Oporornis formosus* and *Myiodiocetes mitratus* with other interesting species were more or less numerous.

From Mt. Carmel an excursion was made to Fox Prairie about thirty-five miles to the north-west. The observations there will be given in an additional list.

As my friend Mr. Ridgway has discussed the faunal and floral relations of the Wabash Valley¹ I would refer the reader to this excellent paper, and proceed to the results of our field work.

¹Proc. B. S. N. H., Vol. XVI, Feb. 18, 1874, pp. 304.

Family **TURDIDÆ.**Genus *Turdus* Linn.

1. *T. mustelinus* Gmel. WOOD THRUSH. Abundant in the bottoms and common in portions of the more elevated woodlands.
2. *T. migratorius* Linn. ROBIN. Apparently not common. A few were seen about the town.

Genus *Harporhynchus* Cab.

3. *H. rufus* Caban. BROWN THRUSH. Not common. A few observed along the roadsides.

Genus *Galeoscoptes* Caban.

4. *G. carolinensis* Caban. CAT BIRD. Common. Usually found about the farms west of the town.

Family **SAXICOLIDÆ.**Genus *Sialia* Sw.

5. *S. sialis* Hald. BLUE BIRD. Abundant, especially about the trees and fences on the wide flat between the town and the river.

Family **SYLVIIDÆ.**Genus *Poliophtila* Sci.

6. *P. cœrulea* Sclat. BLUE-GRAY GNATCATCHER. Very common. Found in the tops of the tall oaks in the bottoms with *Dendroica cœrulea*. Half-fledged young were taken the last of July.

Family **PARIDÆ.**Genus *Lophophanes* Kaup.

7. *L. bicolor* Bonap. TUFTED TITMOUSE. Very numerous everywhere in the woods, although more abundant in the bottoms.

Genus *Parus* Linn.

8. *P. carolinensis* Aud. CAROLINA TITMOUSE. Less abundant than the preceding and more confined to the damp bottom-lands.

Genus *Sitta* Linn.

9. *S. carolinensis* Lath. WHITE-BELLIED NUTHATCH. Found rather commonly throughout the woods.

Family **TROGLODYTIDÆ.**Genus **Thryothorus** *Viell.*

10. **T. ludovicianus** *Bonap.* CAROLINA WREN. Common everywhere in open woods and about brush-piles or logs in clearings. The males sang through July and until well into August. Mr. Ridgway has since informed me that this species sings throughout the year.

A double nest of this species was given me by Mr. John Ridgway of Mt. Carmel, which was obtained by him in the bottoms. The two nests were of about equal size and composed principally of moss and grass. The contiguous sides were slightly united. Both nests were constructed the same season and when found one side contained half fledged young.

11. **T. bewicki** *Bonap.* BEWICK'S WREN. Not very numerous. A few were observed about the yards in town, and a few specimens were obtained along a ruinous hedge fence by the roadside near Fox Prairie.

Family **SYLVICOLIDÆ.**Genus **Mniotilta** *Viell.*

12. **M. varia** *Viell.* BLACK AND WHITE CREEPER. Common throughout the bottoms, and in damp woods on the uplands.

Genus **Protonotaria** *Bd.*

13. **P. citrea** *Baird.* PROTHONOTARY WARBLER. Common in the button-bushes bordering the lagoons in the bottom-lands. Usually found in small parties of from five to six individuals containing the parents with their young. The middle of July the latter were in many cases but just able to follow the old birds. The sudden inundation of the bottoms the last of July drove all the bush-frequenting birds away, and the water not falling until the middle of August they did not return. I did not hear a note from these birds, and were it not for their bright color they would be very difficult to collect.

Genus **Helmitherus** *Raf.*

14. **H. vermivorus** *Bonap.* WORM-EATING WARBLER. Not common. Found in localities similar to those frequented by the preceding.

Genus **Helminthophaga** *Cab.*

15. **H. pinus** *Baird.* BLUE-WINGED YELLOW WARBLER. Rather common in the most densely wooded portions of the bottoms. We found it more numerous about the borders of the cypress swamp than

elsewhere. It was usually found upon the lower branches of tall trees or the tops of saplings searching the twigs on the tips of the branches, its movements strongly suggesting a titmouse as it hung head down or searched the under side of a branch for insects. A faint "cheep" was the only note heard.

Genus *Parula* Bon.

16. *P. americana* Bonap. BLUE YELLOW-BACKED WARBLER. Not common. A few breed.

Genus *Dendroica* Gray.

17. *D. æstiva* Baird. YELLOW WARBLER. Common in the cultivated portions, principally away from the bottoms.

18. *D. maculosa* Bd. BLACK AND YELLOW WARBLER. The only one seen was a migrant taken in the bottoms August 30. (Jencks.)

19. *D. cærulea* Bd. CÆRULEAN WARBLER. The most abundant species of the *Sylvicolidae*. Found everywhere in small parties, but much more numerous in the bottoms.

20. *D. dominica* var. *albilora* Baird. WESTERN YELLOW-THROATED WARBLER. First noted August 30, when they were found to be abundant in a group of elm trees on the river bank near town. During the succeeding three days they were plentiful and thirty-six specimens were taken and many more seen. After September 2nd not a specimen was to be found, though diligent search was made. While here they showed great preference for the elm trees before mentioned, none being found elsewhere. They uttered the faint "cheep" common to most warblers, and one was heard delivering a low song from the top of a tall elm. The notes were so low that even when standing under the same tree the song could only be distinguished by carefully listening.

The movements of these birds while in the trees were rather slow and quite nuthatch-like. Among the specimens taken were some having the loreal line almost immaculate white and others with a bright yellow line in front of the eye. (Jencks.)

Genus *Siurus* Sw.

21. *S. auricapillus* Swains. GOLDEN-CROWNED THRUSH. Abundant in heavy woods.

22. *S. motacilla* Bonap. LARGE-BILLED WATER THRUSH. Not uncommon, but so shy that they were very difficult to obtain, always fitting from tree to tree well in advance, and uttering a sharp metallic note.

Genus *Oporornis* Bd.

23. *O. formosus* Wils. KENTUCKY WARBLER. Abundant in the

bottoms and occasionally straying into the more elevated wood-lands. Its habits closely resemble those of *Siurus auricapillus*. A young bird barely able to follow its parents was taken the last of July in the cypress swamp.

Genus *Geothlypis* Cab.

24. *G. trichas* Caban. MARYLAND YELLOW-THROAT. Common in suitable places about fields.

Genus *Icteria* Vieill.

25. *I. virens* Baird. YELLOW-BREASTED CHAT. Very common in dense brier patches in the bottoms, but owing to their skulking habits were very difficult to obtain. Several young unable to fly were obtained July 19th.

Genus *Myiodioctes* Aud.

26. *M. mitratus* Aud. HOODED WARBLER. Common throughout the heavily timbered bottoms but most abundant in the dense under-growth about the border of the cypress swamp. Frequently found in small bushes close to the ground, though generally keeping in the taller bushes or small trees.

27. *M. canadensis* Aud. CANADA FLYCATCHER. Two specimens were obtained in the bottoms the first of September. (Jencks.)

Genus *Setophaga* Sw.

28. *S. ruticilla* Sw. RED-START. Very common in the bottoms.

Family HIRUNDINIDÆ.

Genus *Progne* Boie.

29. *P. subis* Baird. PURPLE MARTIN. Abundant along the river near town until about August 25th, when they disappeared.

Genus *Petrochelidon* Cab.

30. *P. lunifrons* Bd. CLIFF SWALLOW. Very common.

Genus *Hirundo* Linn.

31. *H. horreorum* Barton. BARN SWALLOW. Abundant until about August 28th.

32. *H. bicolor* Vieill. WHITE-BELLIED SWALLOW. A few stragglers were seen the last of July.

Genus *Stelgidopteryx* Bd.

33. *S. serripennis* Bd. ROUGH-WINGED SWALLOW. Common along the river.

Genus *Cotyle* *Boie*.

34. *C. riparia* *Boie*. BANK SWALLOW. Abundant with the preceding, both species disappearing about the middle of August.

Family VIREONIDÆ.

Genus *Vireo* *Vieill.*

35. *V. olivaceus* *Bonap.* RED-EYED VIREO. Abundant everywhere in the woods.

36. *V. gilvus* *Cassin.* WARBLING VIREO. First seen August 27th; after this date they became common in the bottoms. (Jencks.)

37. *V. flavifrons* *Bd.* YELLOW-THROATED VIREO. Rather common in the bottoms, frequenting the tops of the tallest trees.

38. *V. noveboracensis* *Bonap.* WHITE-EYED VIREO. Common in swampy thickets.

Family LANIIDÆ.

Genus *Collurio* *Vigors.*

39. *C. ludovicianus* var. *ludovicianus*. LOGGER-HEAD SHRIKE. Not common during our stay, but said to be numerous during the breeding season.

Family TANAGRIDÆ.

Genus *Pyranga* *Vieill.*

40. *P. rubra* *Vieill.* SCARLET TANAGER. Abundant everywhere in the bottoms and in every stage of plumage from olive-green to bright scarlet.

41. *P. æstiva* *Vieill.* SUMMER RED BIRD. Rare in the bottoms, but not uncommon about the borders of woods on the uplands. More retiring than the preceding, and in consequence likely to be overlooked, at this season at least.

Family FRINGILLIDÆ.

Genus *Chrysomitris* *Boie.*

42. *C. tristis* *Bon.* GOLD FINCH. Common about the farms and roadsides.

Genus *Poœcetes* *Bd.*

43. *P. gramineus* *Bd.* GRASS FINCH. Rather uncommon, frequenting the fields near town.

Genus *Coturniculus* Bonap.

44. *C. passerinus* Bonap. YELLOW-WINGED SPARROW. Rare in the vicinity of Mt. Carmel. A single specimen was taken in a grain field.

Genus *Chondestes* Sw.

45. *C. grammaca* Bonap. LARK FINCH. Not uncommon along roadsides.

Genus *Spizella* Bonap.

46. *S. pusilla* Bonap. FIELD SPARROW. Abundant in fields and along roadsides.

47. *S. socialis* Bonap. CHIPPING SPARROW. Abundant in all suitable places.

Genus *Peucaea* Aud.

48. *P. æstivalis* Cab. BACHMAN'S FINCH. Rather common. Those obtained were found about the fences or brush piles in half cleared fields. They were shy and quite difficult to secure from their habit of diving into the nearest shelter when alarmed, or skulking, wren-like, along the fences, dodging from rail to rail. One was observed singing from a fence stake, but seeing the intruder it stopped abruptly and darted into a patch of weeds.

Genus *Euspiza* Bonap.

49. *E. americana* Bonap. BLACK-THROATED BUNTING. Quite common about the borders of cornfields and along hedges.

Genus *Cyanospiza* Bd.

50. *C. cyanea* Bd. INDIGO BIRD. Exceedingly common everywhere except in the densely wooded bottoms. Several could often be heard singing at once.

Genus *Cardinalis* Bonap.

51. *C. virginianus* Bonap. *CARDINAL GROSBEAK. Very common everywhere; more numerous than I observed it anywhere else. Its clear whistle was heard from the top of tall trees in the gloomiest portions of the bottoms, as well as from the border of the woods near the farm houses.

Genus *Pipilo* Vieill.

52. *P. erythrophthalmus* Vieill. TOWHEE FINCH. Not uncommon about partly cleared fields.

Family **ICTERIDÆ**.Genus *Molothrus Sw.*

53. *M. ater Gray.* COW BUNTING. Several large flocks were observed the last of July, but none were seen singly, nor after the first of August were any to be found.

Genus *Agelæus Vieill.*

54. *A. phœniceus Vieill.* RED-WINGED BLACKBIRD. Not common.

Genus *Sturnella Vieill.*

55. *S. magna Sw.* MEADOW LARK. Abundant about fields. About the last of July they united into large flocks.

Genus *Icterus Auct.*

56. *I. spurius Bon.* ORCHARD ORIOLE. Common during July and the first of August.

57. *I. baltimore Daud.* BALTIMORE ORIOLE. Not common. A pair, with young, the only specimens observed, were seen the 2nd of August.

Genus *Quiscalus Vieill.*

58. *Q. pupureus Bartr.* var. *æneus Ridg.* PURPLE GRACKLE. Very abundant. Gathered into immense flocks, in the more open portions of the bottoms, the last of July.

Family **CORVIDÆ**.Genus *Corvus Linn.*

59. *C. americanus Aud.* CROW. Very plentiful in large flocks. Not so shy as is usually the case with this species.

Genus *Cyanura Sw.*

60. *C. cristata Sw.* BLUE JAY. Very common everywhere.

Family **TYRANNIDÆ**.Genus *Tyrannus Cuv.*

61. *T. carolinensis Bd.* KING BIRD. Common about farms.

Genus *Myiarchus Cab.*

62. *M. crinitus Cab.* GREAT-CRESTED FLYCATCHER. Very abun-

dant everywhere in the woods and common about the trees on the flat between the river and the town. About the first of September they left for the south.

Genus *Sayornis* Bon.

63. *S. fuscus* Bd. BRIDGE PEWEE. Common about the outskirts of the town and along the river, on the flat.

Genus *Contopus* Cab.

64. *C. virens* Cab. WOOD PEWEE. Abundant everywhere in woods.

Genus *Empidonax* Cab.

65. *E. pusillus* var. *trailli* Bd. TRAILL'S FLYCATCHER. Found in the bottoms, but in smaller numbers than the following.

66. *E. acadicus* Bd. ACADIAN FLYCATCHER. Usually found in the gloomiest portions of the bottoms, where it was common.

Family ALCEDINIDÆ.

Genus *Ceryle* Bois.

67. *C. alcyon* Bois. KINGFISHER. Very common about the ponds in the bottoms and along the rivers.

Family CAPRIMULGIDÆ.

Genus *Chordeiles* Sw.

68. *C. popetue* Bd. NIGHT HAWK. Not observed until about September first, when it became abundant. (Jencks.)

Family CYPSELIDÆ.

Genus *Chaetura* Steph.

69. *C. pelagica* Bd. CHIMNEY SWIFT. Exceedingly abundant. About dusk they would pour forth from their hiding places by hundreds and come swooping and darting over the town in such countless numbers that the air seemed filled with them in every direction.

Family TROCHILIDÆ.

Genus *Trochilus* Linn.

70. *T. colubris* Linn. RUBY-THROATED HUMMING BIRD. Plentiful about the bottoms. Fully developed eggs were taken from the females the last of July.

Family **CUCULIDÆ.**Genus **Coccyzus** *Vieill.*

71. **C. americanus** *Bonap.* YELLOW-BILLED CUCKOO. Common.

Family **PICIDÆ.**Genus **Picus** *Linn.*

72. **P. villosus** *Linn.* HAIRY WOODPECKER. Common.

73. **P. pubescens** *Linn.* DOWNY WOODPECKER. Abundant. Found in the woods everywhere with the preceding.

Genus **Hylotomus** *Bd.*

74. **H. pileatus** *Bd.* PILEATED WOODPECKER. Rare. Said to have been formerly common.

Genus **Centurus** *Sw.*

75. **C. carolinus** *Bonap.* RED-BELLIED WOODPECKER. Very abundant everywhere in the bottoms. Much less frequent in the more elevated timber.

Genus **Melanerpes** *Sw.*

76. **M. erythrocephalus** *Sw.* RED-HEADED WOODPECKER. Very abundant about the borders of clearings and in open woods.

Genus **Colaptes** *Sw.*

77. **C. auratus** *Sw.* GOLDEN-WINGED WOODPECKER. Rather common.

Family **STRIGIDÆ.**Genus **Syrnium** *Sav.*

78. **S. nebulosum** *Gray.* BARRED OWL. Common. Although their notes were heard nightly, the species was rarely seen.

Genus **Scops** *Sav.*

79. **S. asio** *Bon.* SCREECH OWL. A single specimen observed the first of September. (Jencks.) Their notes were occasionally heard in early evening. Fully 90 per cent. of these birds in this locality are of the rufous phase. (Ridgway.)

Genus **Bubo** *Dum.*

80. **B. virginianus** *Bonap.* HORNED OWL. Not common.

Family **FALCONIDÆ.**Genus *Falco* *Auct.*

81. *F. sparverius* *Linn.* SPARROW HAWK. Common. More numerous about clearings in the bottoms than elsewhere.

Genus *Nauclerus* *Vig.*

82. *N. forficatus* *Ridg.* SWALLOW-TAILED HAWK. Rare. Said to be common some years. A single specimen was observed over the river July 20th.

Genus *Ictinia* *Vieill.*

83. *I. mississippiensis* *Gray.* MISSISSIPPI KITE. Rare. Two specimens were observed about a clearing in the bottoms. I am informed by Mr. Ridgway that two of these birds were observed by him September 25th, 1876, sailing in company with turkey buzzards near the town.

Genus *Buteo* *Cuv.*

84. *B. lineatus* *Jard.* RED-SHOULDERED HAWK. Common in the bottoms, about the borders of clearings. Generally two adults with their young were found together.

85. *B. borealis* *Vieill.* RED-TAILED HAWK. Much less common than the preceding. Generally observed soaring over the farms back of town.

Genus *Haliaeetus* *Sav.*

86. *H. leucocephalus* *Sav.* BALD EAGLE. One specimen observed near the river September 4th. (Jencks.)

Family **CATHARTIDÆ.**Genus *Rhinogryphus* *Ridg.*

87. *R. aura* *Ridg.* TURKEY BUZZARD. Very common. Two pairs of unfledged young were found the last of July. The first pair were standing on a large fallen tree, beside which they had probably been hatched. The others were found standing in the entrance to a large and deep cavity in the side of a leaning sycamore. Upon being approached they scrambled back to the extremity of the hole. When they were drawn forth one commenced to disgorge the contents of its crop, while the other made ineffectual attempts to use its bill, and when released ran off into the undergrowth.

Family COLUMBIDÆ.

Genus *Zenaidura* Bonap.

88. *Z. carolinensis* Bonap. CAROLINA DOVE. Very abundant everywhere except in the densely wooded portions of the bottoms.

Family MELEAGRIDÆ.

Genus *Meleagris* Linn.

89. *M. gallopavo* Linn. WILD TURKEY. Very common in the bottoms.

Family TETRAONIDÆ.

Genus *Bonasa* Steph.

90. *B. umbellus* Steph. RUFFED GROUSE. Not common. A few were observed in the bottoms. Mr. Ridgway informs me that all the ruffed grouse from this locality possess rufous tails.

Family PERDICIDÆ.

Genus *Ortyx* Steph.

91. *O. virginianus* var. *virginianus* Bonap. QUAIL. Very numerous on the uplands and remarkably tame. This form is also found in the clearings in the bottoms to some extent, but it is far less numerous than the following. A nest containing fourteen eggs was found in the border of the woods near town August 2nd, and Mr. Ridgway informs me that he has taken the eggs of this species as late as the 24th of September, and that the young are frequently hatched so late that they are killed by the cold weather before they become fully feathered.

91a. *O. virginianus* var. *floridanus* Coues. FLORIDA QUAIL. The prevailing form in the bottoms, where the typical *virginianus* is comparatively rare. The specimens obtained are typical of the variety, some having even larger bills than any Florida examples seen, while the other proportions are equally small, and the colors fully as dark. A remarkable characteristic of this form in southern Illinois is its arboreal habits. The males were repeatedly found uttering their song from the tops of tall trees in densely wooded portions of the bottoms, and when a flock became scattered its members would almost invariably take to the trees, and soon their call notes would resound through the forest. Mr. Ridgway's observations regarding the habits of this form in the vicinity of Mt. Carmel coincide with mine and in his collection also are extremes of the var. *floridanus*.

Unfortunately no specimens of quail were preserved from the Mississippi bottoms, so that whether this form is represented there or not is undecided.

Family CHARADRIIDÆ.

Genus *Charadrius* Linn.

92. *C. pluvialis* var. *virginicus* Bosc. GOLDEN PLOVER. A few were seen the first of September. (Jencks.)

Genus *Ægialitis* Boie.

93. *Æ. vociferus* Cass. KILLDEER PLOVER. Rare during July; became abundant about the middle of August.

94. *Æ. melodus* Cass. PIPING PLOVER. A specimen observed the last of August. (Jencks.)

Family SCOLOPACIDÆ.

Genus *Philohela* Gray.

95. *P. minor* Gray. WOODCOCK. Abundant in a piece of boggy ground near town the last of July; none seen there later.

Genus *Ereunetes* Illig.

96. *E. pusillus* Cass. SEMI-PALMATED SANDPIPER. A large flock observed August 20th. (Jencks.)

Genus *Totanus* Bech.

97. *T. flavipes* Gmel. YELLOW LEGS. Specimens seen the first of September. (Jencks.)

98. *T. solitarius* Wils. SOLITARY SANDPIPER. Not uncommon about secluded pools during our stay.

Genus *Tringoides* Bonap.

99. *T. macularius* Gray. SPOTTED SANDPIPER. Abundant along the rivers. They would frequently alight upon floating logs and feast upon insects, larvæ, etc., that had taken refuge upon the exposed side as the current carried them swiftly down stream.

Genus *Limosa* Briss.

100. *L. fedoa* Ord. MARBLED GODWIT. A single specimen seen the first of September. (Jencks.)

Family **ARDEIDÆ.**Genus *Ardea* Linn.

101. *A. herodias* Linn. GREAT BLUE HERON. Abundant. Breeds in the cypress swamp. In a "rookery" visited by us the nests were placed in the tops of tall sycamores, one tree containing nine nests. Although it was the last of July and the young were able to fly, they still kept in the nests and were fed by the old birds. When driven from the nests by the reports of our guns as some of them were shot, they would fly to some adjacent tree and when we were quiet would return. One old bird made her way to the tree, and alighting beside her nest in full view commenced feeding her young. A charge of No. 9 shot with which she was saluted caused her to turn her head sidewise and gaze down at us with a most ludicrous air of amazement, and then she proceeded with her task, and not until she had filled every gaping mouth did she condescend to seek safety in flight.

102. *A. egretta* Gmel. WHITE HERON. Became common in portions of the bottoms about the last of July.

103. *A. candidissima* Jacquin. SNOWY HERON. Found with the preceding, but less numerous.

104. *A. virescens* Linn. GREEN HERON. Common in the bottoms. Became very abundant after the first of August.

Genus *Ardetta* Gray.

105. *A. exilis* Gray. LEAST BITTERN. One specimen seen the last of July.

Genus *Botaurus* Steph.

106. *B. lentiginosus* Steph. BITTERN. A single specimen observed September 4th. (Jencks.)

Family **RALLIDÆ.**Genus *Rallus* Bech.

107. *R. elegans* Aud. KING RAIL. A specimen shot July 7th, was in the collection of Prof. Stein of Mt. Carmel.

Family **ANATIDÆ.**Genus *Aix* Boie.

108. *A. sponsa* Boie. WOOD DUCK. Abundant about the lagoons in the bottoms.

Family GRACULIDÆ.

Genus *Graculus* Linn.

109. *G. dilophus* var. *floridanus* Aud. FLORIDA CORMORANT.
A single specimen observed the last of August. (Jencks.)

Family LARIDÆ.

Genus *Sterna* Linn.

110. *S. regia* Gamb. ROYAL TERN. A large tern supposed to be this species was seen over the river the last of August. (Jencks.)

111. *S. antillarum* Coues. LEAST TERN. One specimen obtained and others observed the last of August. (Jencks.)

112. *S. fissipes* Linn. SHORT-TAILED TERN. Became common along the river about the first of September. (Jencks.)

Family PODICIPIDÆ.

Genus *Podilymbus* Less.

113. *P. podiceps* Lawr. CAROLINA GREBE. Not common. A pair with half grown young were found in a pond in the bottoms. The female and two young were obtained.

In addition to the above, Mr. Ridgway furnishes the following list of species which he has ascertained to breed at Mt. Carmel:—

1. *Mimus polyglottus*. Common some seasons.
2. *Telmatodytes palustris*. Common.
3. *Cistothorus stellaris*. Common?
4. *Dendroica pinus*. Rare. Found in bottoms, among deciduous trees!
5. *Collurio ludovicianus excubitoroides*. Common?
6. *Passerculus sandwichensis savanna*. Rare?
7. *Guiraca cærulea*. Rare?
8. *Eremophila alpestris*. Rare.
9. *Coccyzus erythrophthalmus*. Rare. [Nest of this species and one of *C. americanus* found on adjoining trees in an orchard.]
10. *Antrostomus vociferus*. Abundant.
11. *Antrostomus carolinensis*. Rare?
12. *Ectopistes migratoria*. Perhaps not now breeding there.
13. *Nisus cooperi*. Rare?
14. *Nisus fuscus*. Rare?
15. *Pandion haliaetus carolinensis*. Rare?
16. *Elanus leucurus*. One pair.

17. *Rallus virginianus*. Rare?
18. *Porzana carolina*. Common.
19. *Porzana noveboracensis*. Rare?
20. *Porzana jamaicensis*. Rare?
21. *Gallinula galeata*. Rare.
22. *Fulica americana*. Rare.
23. *Nyctiardea grisea naevia*. Rare?
24. *Nyctherodias violaceus*. Common?
25. *Anas boschas*. Rare.
26. *Eristamatura rubida*. Rare.
27. *Lophodytes cucullatus*. Rare.

Besides the species named above, the following have been observed during the breeding season, though they have not been definitely ascertained to nest in the neighborhood:—

1. *Helminthophaga chrysoptera*. [Breeds in Richland Co.]
2. *Dendroica pennsylvanica*. [Breeds in Richland Co.]
3. *Cyanospiza ciris*. One specimen, a female, June, 1871.
4. *Catharistes atratus*. Rare.
5. *Himantopus nigricollis*. Rare.
6. *Recurvirostra americana*. Rare.
7. *Tantalus loculator*. Common, some seasons.
8. *Falcinellus igneus*. Rare.
9. *Florida cærulea*. Rare.
10. *Gallinula martinica*. Rare.
11. *Chrococephalus atricilla*. Rare.
12. *Pelecanus erythrorhynchus*. Rare.
13. *Plotus anhinga*. Rare.

Two species, *Campephilus principalis* and *Conurus carolinensis*, the former once rarely found, and the latter so abundant thirty or forty years ago as to be at times a nuisance, have both apparently entirely disappeared.

Fox Prairie, Richland County.

From Mt. Carmel a short trip was made to Fox Prairie, about thirty-five miles northwest of the town. We found the prairie to be partly wild and of a slightly rolling character, crossed by a small stream bordered by banks usually covered with bushes or trees. About the outskirts of the prairie were more or less extended pieces of woodland.

The most striking difference between the avian-fauna of this locality and the vicinity of Mt. Carmel, as would be expected, was in the absence of most of the species found in the densely wooded bottoms and the presence of the prairie frequenting species. In the woods

about the prairie the species found were about the same as those observed in the elevated woods at Mt. Carmel.

The following woodland species were found:—

1. *Turdus mustelinus* Gm. Common.
2. *T. migratorius* L. Rare.
3. *Galeoscoptes carolinensis* Gray. Not common.
4. *Harporhynchus rufus* Cab. Not common.
5. *Poliophtila cærulea* Sclat. Common.
6. *Lophophanes bicolor* Bonap. Common.
7. *Mniotilta varia* Vieill. Not common.
8. *Helmitherus vermivorus* Bon. One specimen.
9. *Siurus auricapillus* Sw. Common.
10. *Oporornis formosus* Bd. Rather common.
11. *Setophaga ruticilla* Sw. Abundant.
12. *Pyrrhula æstiva* Vieill. Common.
13. *Vireo olivaceus* Vieill. Abundant.
14. *V. flavifrons* Vieill. Not common.
15. *Cardinalis virginianus* Bonap. Common.
16. *Cyanurus cristatus* Sw. Common.
17. *Myiarchus crinitus* Cab. Common.
18. *Contopus virens* Cab. Common.
19. *Coccyzus americanus* Bon. Not common.
20. *Picus villosus* L. Rather common.
21. *P. pubescens* L. Common.
22. *Hylotomus pileatus* Bd. Rather common.
23. *Centurus carolinus* Bon. Common.
24. *Melanerpes erythrocephalus* Sw. Not common.
25. *Colaptes auratus* Sw. Not common.
26. *Syrnium nebulosum* Gray. Common.
27. *Scops asio* Bon. Not common.
28. *Nisus cooperi*. One specimen.
29. *Meleagris gallopavo* L. Common.

The species found upon the prairie and about its outskirts were as follows:—

1. *Geothlypis trichas* Cab. In the bushes along edge of fields or woods.
2. *Vireo belli* Aud. Rather common in the dense patches of bushes on the prairie. The males would appear on the top of a tall bush and utter a queer song entirely peculiar, but so shy were they that at the first alarm they would disappear. Although repeated efforts were made to obtain specimens during the week we were there, only two were shot.

3. *Collurio ludovicianus* Bd. **LOGGERHEAD SHRIKE.** Rather common about the outskirts of the prairie.

4. *Chrysomitris tristis* Bon. Common.

5. *Poæetes gramineus* Bd. Rather common.

6. *Ammodromus passerinus* Gray. Common on the prairie, but less numerous than in similar situations in the northern portion of the state.

7. *A. henslowi* Gray. Very common, much more numerous than in the northern portions of the state.

8. *Chondestes grammaca* Bonap. Not very common. Most numerous along roadsides.

9. *Spizella pusilla* Bon. Abundant about the borders of the prairie.

10. *Peucea æstivalis* Cab. This species was rather common in a half-cleared field between Mt. Carmel and the prairie.

11. *Euspiza americana* Bon. Not very common.

12. *Cyanospiza cyanea* Bd. About the borders of the prairie.

13. *Pipilo erythrophthalmus* Vieill. A nest containing three eggs situated in a bush about three feet from the ground was taken on the border of the prairie.

14. *Eremophila alpestris* var. *leucolæma* Cs. Common upon the prairie.

15. *Molothrus pecoris* Sw. A few seen about the farms.

16. *Sturnella magna* Sw. Rather common.

17. *Corvus corax* var. *carnivorus* Bartr. A raven was killed in a field on one side of the prairie the week before we were there.

18. *Tyrannus carolinensis* Bd. About the border of the prairie.

19. *Empidonax pusillus* var. *trailli* Bd. Quite numerous along the sides of a shallow ravine intersecting the prairie.

20. *Trochilus colubris* L. Common about the borders of the prairie.

21. *Nauclerus forficatus* Ridgw. Five specimens were observed passing over the prairie one of the first days of our stay; after this only one or two single specimens were seen, although in years previous to this my friend Mr. Ridgway has found these birds abundant here at this season.

22. *Ictinia mississippiensis* Gray. Only a few specimens were observed. They were usually found circling over a herd of cattle which caused grasshoppers and other large insects to rise, thus giving the kites a good opportunity to procure their food with little labor.

23. *Buteo borealis* Vieill. A few specimens were observed soaring over the prairie.

24. *Buteo swainsoni* Bonap. During our first day upon the prairie a pair of the Swainson's hawks were secured, and the following day a boy guided us to a tree on the outskirts of the prairie, where he stated the birds we had killed had raised young that season. This we

found to be true, as two young of the year were obtained from the very tree, and in which could be seen the remains of a poorly constructed nest.

25. *Rhinogryphus aura* Ridgw. Abundant.

26. *Zenaidura carolinensis* Bonap. Very common. A nest containing two fresh eggs was found on a knoll on the prairie. The wheel of our wagon nearly ran over the female as we were driving by.

27. *Cupidonia cupido* Bd. Not very numerous.

28. *Ortyx virginianus* Bonap. Not as numerous as in the bottoms near Mt. Carmel.

29. *Ægialitis vociferus* Cass. Common.

30. *Totanus solitarius* Wils. A few specimens were seen about small ponds of water on the prairie.

31. *Actiturus bartramius* Bonap. Very numerous on the prairie.

32. *Tringoides macularius* Gray. Several observed about the small ponds.

33. *Ardea herodias* Linn. Two specimens kept about the prairie ponds.

34. *Ardea egretta* Gmel. One specimen observed with the preceding.

35. *Ardea virescens* Linn. A few specimens observed.

At this locality, Mr. Ridgway observed in June, 1871, *Mimus polyglottus* (not rare), *Vireo gilvus* (common), *Helminthophaga chrysoptera* (rare), *Dendroica pennsylvanica* (rare), *Geothlypis philadelphia* (rare), *Passerculus savanna* (rare), *Buteo lineatus*, *Falco sparverius*, and *Nisus fuscus*; while in August, of the same year, a specimen of *Asturina plagiata* Licht. was seen.

Cairo and Vicinity.

The observations in this vicinity extended from August 17th to 31st. A portion of the time was passed either at Cairo or six miles above at Mound City, but an excursion to Anna, Union County, was made between the 19th and 26th, the results of which will be given in a supplementary list.

The country near Cairo, along the Illinois side of the Ohio to the mouth of the Cache River and several miles up the Mississippi, with the included country, is very low and, near the rivers, interspersed with swampy lagoons and marshy openings in the woods. These form favorite haunts for herons and other water birds, while the heavy woods of the bottom lands, which at this place are situated back from the river, are frequented by nearly the same species as occur in the bottoms at Mt. Carmel. Above the point where the Cache flows into the Ohio, as well as on the opposite shore in Kentucky and across the Mississippi into Missouri, the woods end abruptly on the river banks.

In the immediate vicinity of Cairo the country is open and treeless, but about a mile back from town a growth of bushes commences which extends back to the heavy forests of the bottoms. It is in this bushy belt that many of the lagoons are situated. Opposite Mound City, six miles above Cairo, is a large cypress swamp and cane brake.

As the bottoms had been flooded a short time before my visit, the small woodland species were present in much smaller numbers than would otherwise have been the case, while to this cause may be partly accredited the immense numbers of herons I found there.

Family **TURDIDÆ.**

Genus *Turdus* Linn.

1. *T. mustelinus* Gm. WOOD THRUSH. Common in the higher portions of the bottoms.

2. *T. migratorius* Linn. ROBIN. A few were observed near Mound City.

Genus *Mimus* Bote.

3. *M. polyglottus* Bote. MOCKING BIRD. Rare. Only observed at Mound City. A specimen of *Collurio ludovicianus* was pointed out as one of these birds by one of the inhabitants who could not be convinced to the contrary.

Genus *Galeoscoptes* Cab.

4. *G. carolinensis* Cab. CAT BIRD. Not common. A few were seen near Mound City.

Family **SAXICOLIDÆ.**

Genus *Sialia* Sw.

5. *S. sialis* Bd. BLUE BIRD. Common near Mound City.

Family **SYLVIIDÆ.**

Genus *Polioptila* Sci.

6. *P. cærulea* Sci. BLUE-GRAY GNATCATCHER. Abundant in the elevated portions of the bottoms.

Family **PARIDÆ.**

Genus *Lophophanes* Kaup.

7. *L. bicolor* Bonap. TUFTED TITMOUSE. Everywhere common in the woods.

Genus *Parus* Linn.

8. *P. carolinensis* Aud. CAROLINA TITMOUSE. Not uncommon in the bottoms about the borders of ponds and lagoons.

Genus *Sitta* Linn.

9. *S. carolinensis* Gm. WHITE-BELLIED NUTHATCH. Not so numerous as at Mt. Carmel.

Family TROGLODYTIDÆ.

Genus *Thryothorus* Vieill.

10. *T. ludovicianus* Bonap. CAROLINA WREN. Not common. A single pair were observed near Mound City.

Family SYLVICOLIDÆ.

Genus *Mniotilta* Vieill.

11. *M. varia* Vieill. BLACK AND WHITE CREEPER. Common throughout the woods.

Genus *Protonotaria* Bd.

12. *P. citrea* Bd. PROTHONOTARY WARBLER. Very uncommon, probably owing to the late high water. Only a few were observed about the borders of lagoons in dense bushes.

Genus *Dendroeca* Gray.

13. *D. æstiva* Bd. YELLOW WARBLER. Not common. A few observed in bushes along roadsides near Mound City.

14. *D. cærulea* Bd. CÆRULEAN WARBLER. Numerous in low woods back of Mound City and in Cache River bottoms.

Genus *Siurus* Sw.

15. *S. auricapillus* Sw. GOLDEN-CROWNED THRUSH. Common in the bottoms.

16. *S. motacilla* Coues. LARGE-BILLED WATER THRUSH. Not common; found in low situations near Mound City and in the Kentucky and Missouri bottoms.

Genus *Oporornis* Bd.

17. *O. formosus* Bd. KENTUCKY WARBLER. Common in heavily timbered bottoms on both sides of the rivers.

Genus *Geothlypis* Cab.

18. *G. trichas* Cab. MARYLAND YELLOW-THROAT. Not common. A few were seen in the weeds along the railroad track near Cairo.

Genus *Setophaga* Sw.

19. *S. ruticilla* Sw. RED-START. Abundant in low woods near Mound City and in the Missouri bottoms.

Family **HIRUNDINIDÆ.**Genus *Progne* Bote.

20. *P. subis* Bd. PURPLE MARTIN. During the first half of my visit but few martins were to be seen, but the last of August they appeared in immense numbers about the towns and over the rivers.

Genus *Petrochelidon* Bd.

21. *P. lunifrons* Bd. CLIFF SWALLOW. Abundant with the preceding.

Genus *Hirundo* Linn.

22. *H. horreorum* Barton. BARN SWALLOW. This and the two preceding species, in company with the chimney swifts, towards the last of August would appear over the rivers in immense numbers about an hour before sunset and until dark would circle and dart back and forth over the smooth surface of the water in pursuit of their prey.

Genus *Stelgidopteryx* Bd.

23. *S. serripennis* Bd. ROUGH-WINGED SWALLOW. Rather common along the river banks, usually found perching in groups at mid-day on dead branches overhanging the river.

Genus *Cotyle* Bote.

24. *C. riparia* Bote. BANK SWALLOW. Very abundant.

Family **VIREONIDÆ.**Genus *Vireo* Vieill.

25. *V. olivaceus* Vieill. RED-EYED VIREO. Abundant throughout the bottoms.

26. *V. flavifrons* Vieill. YELLOW-THROATED VIREO. Rather common near Mound City and in the Kentucky and Missouri bottoms.

27. *V. noveboracensis* Bonap. WHITE-EYED VIREO. Abundant in swampy thickets near the river in Missouri and not uncommon near Mound City.

Family **LANIIDÆ.**

Genus *Collurio* Vig.

28. *C. ludovicianus* Bd. LOGGERHEAD SHRIKE. A few pairs observed near Mound City.

Family **TANAGRIDÆ.**

Genus *Pyranga* Vieill.

29. *P. rubra* Vieill. SCARLET TANAGER. Very few observed. Only seen near Mound City.

30. *P. æstiva* Vieill. SUMMER RED BIRD. Like the preceding, not common.

Family **FRINGILLIDÆ.**

Genus *Chrysomitris* Boie.

31. *C. tristis* Bon. GOLDFINCH. A few observed near Mound City.

Genus *Spizella* Bonap.

32. *S. pusilla* Bonap. FIELD SPARROW. Common along roadsides and on the outskirts of the towns.

33. *S. socialis* Bonap. CHIPPING SPARROW. Rather common with the preceding.

Genus *Cyanospiza* Bd.

34. *C. cyanea* Bd. INDIGO BIRD. A few were observed near Mound City.

Genus *Cardinalis* Bonap.

35. *C. virginianus* Bonap. CARDINAL GROSBEAK. Not common. A few were observed about clearings in the bottoms.

Genus *Pipilo* Vieill.

36. *P. erythrophthalmus* Vieill. TOWHEE. Not common. A few specimens observed near Mound City.

Family **ICTERIDÆ.**Genus **Molothrus** Sw.

37. **M. pecoris** Sw. COW BUNTING. A few were observed along the levee near Mound City.

Genus **Icterus** Auct.

38. **I. baltimore** Daud. BALTIMORE ORIOLE. A single pair were seen in an old orchard in Kentucky, opposite Mound City.

Genus **Quiscalus** Vieill.

39. **Q. pupureus** Bartr. var. **seneus** Ridg. PURPLE GRACKLE. A few specimens were seen along the Ohio levee.

Family **CORVIDÆ.**Genus **Corvus** Linn.

40. **C. americanus** Aud. CROW. Only observed near Cairo, where they were not common. They were usually found in company with turkey buzzards along the river banks.

Genus **Cyanurus** Sw.

41. **C. cristatus** Sw. BLUE JAY. Common everywhere in woods.

Family **TYRANNIDÆ.**Genus **Tyrannus** Cuv.

42. **T. carolinensis** Bd. KING BIRD. But few observed; found along the levees and the borders of the woods near Mound City.

Genus **Myiarchus** Cab.

43. **M. crinitus** Cab. GREAT-CRESTED FLYCATCHER. Abundant in the bottoms.

Genus **Sayornis** Bonap.

44. **S. fuscus** Bd. BRIDGE PEWEE. Common along the levee near Mound City.

Genus **Contopus** Cab.

45. **C. virens** Cab. WOOD PEWEE. Abundant in the woods near Mound City.

Genus *Empidonax* Cab.

46. *E. pusillus* var. *trailli* Bd. TRAILL'S FLYCATCHER. A few observed near Mound City.

47. *E. acadicus* Bd. SMALL GREEN-CRESTED FLYCATCHER. More plentiful than the preceding. Found in the bottoms.

Family *ALCEDINIDÆ*.Genus *Ceryle* Bote.

48. *C. alcyon* Bote. KINGFISHER. Common along the rivers.

Family *CYPSELIDÆ*.Genus *Chætura* Steph.

49. *C. pelagica* Bd. CHIMNEY SWIFT. Very abundant. I obtained a nest of this species from an immense hollow sycamore stub in the Missouri bottoms opposite Cairo. It was about ten feet from the ground and attached to the interior of the cavity in the usual manner.

Family *TROCHILIDÆ*.Genus *Trochilus* Linn.

50. *T. colubris* Linn. RUBY-THROATED HUMMING BIRD. A few observed near Mound City.

Family *CUCULIDÆ*.Genus *Coccyzus* Vieill.

51. *C. americanus* Bonap. YELLOW-BILLED CUCKOO. A single specimen observed on a timbered island in the Ohio.

Family *PICIDÆ*.Genus *Picus* Linn.

52. *P. villosus* Linn. HAIRY WOODPECKER. Not common.

53. *P. pubescens* Linn. DOWNY WOODPECKER. More numerous than the preceding. Found throughout the woods.

Genus *Hylotomus* Bd.

54. *H. pileatus* Bd. PILEATED WOODPECKER. Not uncommon in the bottoms. Frequently observed flying across the Ohio and Mississippi.

Genus *Centurus* Sw.

55. *C. carolinus* Bonap. RED-BELLIED WOODPECKER. Common in the bottoms.

Genus *Melanerpes* Sw.

56. *M. erythrocephalus* Sw. RED-HEADED WOODPECKER. Common in clearings in the bottoms.

Genus *Colaptes* Sw.

57. *C. auratus* Sw. YELLOW-SHAFTED FLICKER. Two specimens observed near Mound City.

Family **FALCONIDÆ.**Genus *Falco* Auct.

58. *F. sparverius* Linn. SPARROW HAWK. Common everywhere about clearings and the borders of woods.

Genus *Nauclerus* Vig.

59. *N. forficatus* Ridg. SWALLOW-TAILED KITE. Numerous in the immediate vicinity of Calro, where I was informed it had been abundant the week previous to my arrival.

At the junction of the Ohio and Mississippi Rivers is a long point bearing a growth of cottonwoods. The river was so high during my visit that the land was submerged, thus causing a great many grasshoppers to take refuge in the tree tops. This afforded the kites a fine opportunity for capturing their prey, of which they were not long in taking advantage. The kites would first appear about ten o'clock and in a small flock would proceed to work in the following manner: The trees were situated in an oblong patch and the kites would hunt around the border, making a complete circuit. They kept but a few feet above the tree-tops and when a grasshopper was observed, by a turn of the long tail and a sweep of the wings, the bird would dart towards its prey until within reach, when with a sudden upward turn it would reach forth its feet and, grasping the insect, proceed with outstretched wings to feed upon the remains of its victim while passing slowly along with its companions. As each grasshopper was captured the bird's abdomen and tail would brush against the leaves with a loud "swish;" in consequence the feathers upon the abdomen and under tail coverts were badly worn and discolored.

Their hunting usually continued until about one o'clock, P. M., when they would leave to return at the usual time the next morning.

Genus *Ictinia* Vieill.

60. I. mississippiensis Gray. MISSISSIPPI KITE. Abundant. This species would appear at the same time in the morning as the preceding, but would remain until late in the afternoon. Instead of choosing the same hunting ground as the swallow-tail, this bird kept about the open, marshy piece of land between Cairo and the woods and about the border of the latter. They were also more numerous than the other species; nearly fifty were counted at one time, all circling about over the marshy land just outside the town.

Their power of sight is truly wonderful. I saw them repeatedly dart with unerring aim upon some luckless grasshopper, from an elevation of at least one hundred yards.

No less remarkable is their power of flight, in force and rapidity far excelling that of the preceding. Near Mound City they were common about the border of the woods and here their power of flight was exhibited to a better advantage. I repeatedly saw them dart down from a great height with such velocity that it would seem an impossibility for them to escape being dashed to pieces on the ground, but instead, when within a few feet of the earth, they would suddenly spread their wings and the reaction would lift them with almost equal rapidity to about one-half their former elevation. They were so shy that it was impossible to get within gunshot of them.

Genus *Buteo* Cuv.

61. B. lineatus Jard. RED-SHOULDERED HAWK. Common everywhere about clearings containing dead trees or on the borders of woods.

62. B. borealis Vieill. RED-TAILED HAWK. Only two or three specimens observed.

Family CATHARTIDÆ.

Genus *Rhinogryphus* Ridg.

63. R. aura Ridg. TURKEY BUZZARD. Very numerous and much more familiar than at Mt. Carmel.

Family COLUMBIDÆ.

Genus *Zenaidura* Bonap.

64. Z. carolinensis Bonap. CAROLINA DOVE. Not common. A few were seen along the railroad tracks and the levees.

Family **MELEAGRIDÆ.**Genus *Meleagris* Linn.

65. *M. gallopavo* Linn. WILD TURKEY. Abundant in the wilder portions of the bottoms, especially in Kentucky and Missouri.

Family **PERDICIDÆ.**Genus *Ortyx* Steph.

66. *O. virginianus* Bonap. QUAIL. But few were seen, although they were reported to be common.

Family **CHARADRIIDÆ.**Genus *Ægialitis* Bote.

67. *Æ. vociferus* Cass. KILLDEER. Not common. A few were observed on sandbars along the Ohio.

Family **HÆMATOPODIDÆ.**Genus *Streptopelia* Illig.

68. *S. interpres* Ill. TURNSTONE. A single specimen, in winter plumage, was observed August 30th, on a sandbar near Mound City.

Family **SCOLOPACIDÆ.**Genus *Tringoides* Bonap.

69. *T. macularius* Gray. SPOTTED SANDPIPER. Common along the rivers.

Family **CICONIIDÆ.**Genus *Tantalus* Linn.

70. *T. loculator* Linn. WOOD IBIS. Very common about Mound City. A large flock containing about fifty individuals frequented a sandbar at the mouth of a creek near Mound City. They would commence fishing early in the morning and by seven or eight o'clock would be comfortably gorged, when they would gather in small groups on the sandbar and stand dozing in the sun until about noon or after, when some of the number would rise high overhead and soar about with motionless wings in company with the buzzards. When standing upon the sandbar I found them not easily approached, but becoming alarmed they would fly back a short distance and alight in dead

trees, when I did not have much difficulty in procuring several specimens. Those killed early in the morning were so gorged that when they fell the fish would protrude from their bills, and they presented a most filthy appearance. One specimen, which was brought down with a broken wing, fought viciously, making a spirited but ineffectual charge when approached. These birds are known to many of the inhabitants as "Black-winged Pelicans." I was informed that they made their appearance in large numbers every year about the first of August, and remained until the last of September.

Family **ARDEIDÆ.**

Genus *Ardea* Linn.

71. *A. herodias* Linn. GREAT BLUE HERON. Common about the lagoons.

72. *A. egretta* Gm. WHITE HERON. Very numerous about streams and lagoons.

73. *A. cœrulea* Linn. LITTLE BLUE HERON. Exceedingly abundant everywhere through the bottoms along streams and about lagoons and ponds. Not a pool was visited in the bottoms that did not have from one to a dozen of these birds about it, and along the Cache River they were found by hundreds, and they were equally abundant about all the larger bodies of water. During the day the various species of herons were generally distributed through the bottoms, but towards evening they commenced passing toward a common roosting place, which was in a large opening in the Mississippi bottoms about six miles from Cairo, known as the "deadening." At first, about an hour before sunset, a few straggling parties would be seen passing over and just before sunset they were flying in full force, often a dozen or more flocks, numbering from two or three to fifty or more individuals, could be seen at once. Often one of the larger species would start alone and be joined by small parties of the little blue and snowy herons until quite a company was formed.

74. *A. candidissima* Jacquin. SNOWY HERON. Far less numerous than the preceding. Found in the same locations.

75. *A. rufa* Bodd. REDDISH EGRET. This species was quite common about the borders of lagoons and open marshy situations. They were exceedingly shy and rather solitary, being generally found away from the other species and when startled from a feeding place, instead of going off in company with the others, they usually took another direction.

76. *A. virescens* Linn. GREEN HERON. Numerous along the Cache and about lagoons.

Family **ANATIDÆ.**Genus **Aix** *Bote.*

77. A. sponsa *Bote.* WOOD DUCK. Common about ponds in the bottoms.

Family **PLOTIDÆ.**Genus **Plotus** *Linn.*

78. P. anHINGA *Linn.* SNAKE BIRD. Not common. A few were observed perching on dead sycamores over a lagoon near Cairo.

Family **LARIDÆ.**Genus **Sterna** *Linn.*

79. S. antillarum *Coues.* LEAST TERN. Not uncommon in small flocks along the rivers.

Vicinity of Anna, Union County.

My visit to this locality extended from August 19th to 26th. In the immediate vicinity of Anna the country is hilly and well wooded. About eight miles west the surface changes abruptly to the flat Mississippi bottoms. The bottoms here were somewhat different from any hitherto visited. The ponds were considerably larger and sheltered several species not before noted during the summer.

The species found on the wooded hills about Anna were as follows :

1. *Turdus mustelinus.* Common.
2. *Galeoscoptes carolinensis.* Not very common.
3. *Harporhynchus rufus.* Not very common.
4. *Sialia sialis.* Not common.
5. *Poliophtila cærulea.* Common.
6. *Lophophanes bicolor.* Abundant.
7. *Sitta carolinensis.* Common.
8. *Mniotilta varia.* Common.
9. *Dendroica æstiva.* Not common.
10. *Skurus auricapillus.* Common.
11. *Geothlypis trichas.* Not common.
12. *Setophaga ruticilla.* Common.
13. *Progne subis.* Not common.
14. *Petrochelidon lunifrons.* Common.
15. *Hirundo horreorum.* Common.
16. *Vireo olivaceus.* Abundant.
17. *Vireo flavifrons.* Rather common.

18. *Collurto ludovicianus*. Rare.
19. *Pyrranga rubra*. Not common.
20. *Chrysomitris tristis*. Common.
21. *Spizella pusilla*. Common.
22. *Spizella socialis*. Not common.
23. *Melospiza melodia*. Two or three seen.
24. *Euspiza americana*. Not common.
25. *Cyanospiza cyanea*. Not common.
26. *Cardinalis virginianus*. Not common.
27. *Pipilo erythrophthalmus*. Rather common.
28. *Molothrus pecoris*. Common.
29. *Icterus ballimore*. Several pairs seen.
30. *Quiscalus purpureus*. Common.
31. *Corvus americanus*. Not common.
32. *Cyanurus cristatus*. Common.
33. *Tyrannus carolinensis*. Rather common.
34. *Myiarchus crinitus*. Rather common.
35. *Sayornis fuscus*. Not common.
36. *Contopus virens*. Common.
37. *Chordeiles popetue*. Migrating August 24.
38. *Chatura pelagica*. Few seen.
39. *Trochilus colubris*. Not common.
40. *Picus villosus*. Not common.
41. *Picus pubescens*. Common.
42. *Hylotomus pileatus*. Abundant.
43. *Centurus carolinus*. Numerous.
44. *Melanerpes erythrocephalus*. Not common.
45. *Colaptes auratus*. Not common.
46. *Falco sparverius*. Not common.
47. *Ictinia mississippiensis*. One specimen seen.
48. *Buteo borealis*. Not uncommon.
49. *Rhinogryphus aura*. Not common.
50. *Zenaidura carolinensis*. Abundant.
51. *Ortyx virginianus*. Very common.

During a day passed in the Mississippi bottoms about ten miles west of Anna, the following species were noted :

1. *Turdus mustelinus*. Abundant.
2. *Galeoscoptes carolinensis*. Not common.
3. *Polioptila caerulea*. Numerous.
4. *Lophophanes bicolor*. Very common.
5. *Parus carolinensis*. Common.
6. *Thryothorus ludovicianus*. Not common.

7. *Mniotilta varia*. Numerous.
8. *Protonotaria citrea*. Common.
9. *Dendroica caerulescens*. Common.
10. *Sturus auricapillus*. Very common.
11. *Sturus motacilla*. Common.
12. *Oporornis formosus*. Not common.
13. *Geothlypis trichas*. One or two seen.
14. *Icteria virens*. One specimen seen.
15. *Setophaga ruticilla*. Very numerous.
16. *Cotyle riparia*. Abundant.
17. *Stelgidopteryx serripennis*. Common.
18. *Vireo olivaceus*. Abundant.
19. *Vireo flavifrons*. Common.
20. *Vireo noveboracensis*. Common.
21. *Pyranga rubra*. Not common.
22. *Pyranga aestiva*. Not common.
23. *Cyanospiza cyanea*. Numerous.
24. *Cardinalis virginianus*. Not common.
25. *Pipilo erythrophthalmus*. Not common.
26. *Agelaius phoeniceus*. Several seen.
27. *Icterus baltimore*. Not common.
28. *Quiscalus purpureus*. Abundant.
29. *Corvus americanus*. Not common.
30. *Cyanurus cristatus*. Common.
31. *Tyrannus carolinensis*. Common.
32. *Myiarchus crinitus*. Abundant.
33. *Contopus virens*. Common.
34. *Empidonax acadicus*. Common.
35. *Ceryle alcyon*. Rather common.
36. *Chactura pelagica*. Not common.
37. *Trochilus colubris*. Common.
38. *Coccyzus americanus*. Common.
39. *Picus villosus*. Rather common.
40. *Picus pubescens*. Numerous.
41. *Hylotomus pileatus*. Common.
42. *Centurus carolinensis*. Numerous.
43. *Melanerpes erythrocephalus*. Not common.
44. *Syrnium nebulosum*. One seen.
45. *Buteo lineatus*. Not common.
46. *Rhinogryphus aura*. Common.
47. *Zenaidura carolinensis*. Abundant.
48. *Meleagris gallopavo*. Said to be common.
49. *Ortyx virginianus*. Common.
50. *Egialitis vociferus*. Common.

51. *Tringoides macularius*. Numerous.
52. *Tantalus loculator*.
53. *Ardea herodias*. Common.
54. *Ardea egretta*. Not common.
55. *Ardea candidissima*. Not common.
56. *Ardea virescens*. Common.
57. *Botaurus lentiginosus*. One seen.
58. *Gallinula galeata*. Several pairs with full-grown young were seen in a large pond.
59. *Branta canadensis*. A number were observed, and I was informed by a farmer that they nested about the ponds every year.
60. *Anas discors*. A few observed.
61. *Aix sponsa*. Very abundant in the ponds.
62. *Mergus cucullatus*. Several pairs with full-grown young were found in a pond and one specimen obtained.
63. *Sterna fassipes*. Several were seen about the ponds.

A COMPLETE LIST OF THE BIRDS OBSERVED IN SOUTHERN ILLINOIS,
BETWEEN JULY 19TH AND SEPTEMBER 4TH, 1876.

- | | |
|---------------------------------------|---|
| 1. <i>Turdus mustelinus</i> . | 33. <i>Hirundo bicolor</i> . |
| 2. " <i>migratorius</i> . | 34. <i>Cotyle riparia</i> . |
| 3. <i>Galeoscoptes carolinensis</i> . | 35. <i>Steigidopteryx serripennis</i> . |
| 4. <i>Mimus polyglottus</i> . | 36. <i>Vireo olivaceus</i> . |
| 5. <i>Harporhynchus rufus</i> . | 37. " <i>gilvus</i> . |
| 6. <i>Sialia sialis</i> . | 38. " <i>flavifrons</i> . |
| 7. <i>Polioptila cærulea</i> . | 39. " <i>noveboracensis</i> . |
| 8. <i>Lophophanes bicolor</i> . | 40. " <i>belli</i> . |
| 9. <i>Parus carolinensis</i> . | 41. <i>Collurio ludovicianus</i> . |
| 10. <i>Sitta carolinensis</i> . | 42. <i>Pyranga rubra</i> . |
| 11. <i>Thryothorus ludovicianus</i> . | 43. " <i>æstiva</i> . |
| 12. " <i>bewicki</i> . | 44. <i>Chrysomitris tristis</i> . |
| 13. <i>Mniotilta varia</i> . | 45. <i>Poæcetes gramineus</i> . |
| 14. <i>Protonotaria citrea</i> . | 46. <i>Ammodromus passerinus</i> . |
| 15. <i>Helminthus vermivorus</i> . | 47. " <i>henslowi</i> . |
| 16. <i>Helminthophaga pinus</i> . | 48. <i>Chondestes grammacus</i> . |
| 17. <i>Parula americana</i> . | 49. <i>Spizella pusilla</i> . |
| 18. <i>Dendroica æstiva</i> . | 50. " <i>socialis</i> . |
| 19. " <i>maculosa</i> . | 51. <i>Melospiza melodia</i> . |
| 20. " <i>cærulea</i> . | 52. <i>Peucaea æstivalis</i> . |
| 21. " <i>var. albilora</i> . | 53. <i>Euspiza americana</i> . |
| 22. <i>Sturus auricapillus</i> . | 54. <i>Cyanospiza cyanea</i> . |
| 23. " <i>motacilla</i> . | 55. <i>Cardinalis virginianus</i> . |
| 24. <i>Oporornis formosus</i> . | 56. <i>Pipilo erythrophthalmus</i> . |
| 25. <i>Geothlypis trichas</i> . | 57. <i>Eremophila var. leucolæma</i> . |
| 26. <i>Icteria virens</i> . | 58. <i>Dolichonyx oryzivorus</i> . |
| 27. <i>Myiodyctes mitratus</i> . | 59. <i>Molothrus pecoris</i> . |
| 28. " <i>canadensis</i> . | 60. <i>Agelaius phœniceus</i> . |
| 29. <i>Setophaga ruticilla</i> . | 61. <i>Sturnella magna</i> . |
| 30. <i>Progne subis</i> . | 62. <i>Icterus baltimore</i> . |
| 31. <i>Petrochelidon lunifrons</i> . | 63. " <i>spurius</i> . |
| 32. <i>Hirundo horreorum</i> . | 64. <i>Quiscalus purpureus</i> . |

65. *Corvus corax*.
66. " *americanus*.
67. *Cyanurus cristatus*.
68. *Tyrannus carolinensis*.
69. *Myiarchus crinitus*.
70. *Sayornis fuscus*.
71. *Contopus virens*.
72. *Empidonax* var. *traillii*.
73. " *acadicus*.
74. *Ceryle alcyon*.
75. *Chordeiles pictus*.
76. *Chaetura pelagica*.
77. *Trochilus colubris*.
78. *Coccyzus americanus*.
79. *Picus villosus*.
80. " *pubescens*.
81. *Hylotomus pileatus*.
82. *Centurus carolinus*.
83. *Melanerpes erythrocephalus*.
84. *Colaptes auratus*.
85. *Syrnium nebulosum*.
86. *Scops asio*.
87. *Bubo virginianus*.
88. *Falco sparverius*.
89. *Nauclerus forficatus*.
90. *Ictinia mississippiensis*.
91. *Nisus cooperi*.
92. *Buteo lineatus*.
93. " *borealis*.
94. " *swainsoni*.
95. *Haliaeetus leucocephalus*.
96. *Irhinogryphus aura*.
97. *Zenaidura carolinensis*.
98. *Meleagris gallopavo*.
99. *Bonasa umbellus*.
100. *Cupidonia cupido*.
101. *Oryz virginianus*.
102. *Charadrius virginicus*.
103. *Egialitis vociferus*.
104. " *melodus*.
105. *Streptelas interpres*.
106. *Philohela minor*.
107. *Ereunetes pusillus*.
108. *Totanus flavipes*.
109. " *soliarius*.
110. *Tringoides macularius*.
111. *Actiturus bartramius*.
112. *Limosa fedoa*.
113. *Tantalus loculator*.
114. *Ardea herodias*.
115. " *egretta*.
116. " *candidissima*.
117. " *cerulea*.
118. " *rufa*.
119. " *virescens*.
120. *Ardetta exilis*.
121. *Botaurus lentiginosus*.
122. *Rallus elegans*.
123. *Gallinula galeata*.
124. *Branta canadensis*.
125. *Anas discors*.
126. *Aix sponsa*.
127. *Mergus cucullatus*.
128. *Graculus* var. *floridanus*.
129. *Plotus aninga*.
130. *Sterna regia*?
131. " *antillarum*.
132. " *fissipes*.
133. *Podilymbus podiceps*.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 9. SALEM, APR., MAY, JUNE, 1877. Nos. 4, 5, 6.

REGULAR MEETING, MONDAY, MARCH 5, 1877.

MEETING this evening. The PRESIDENT in the chair.
Records read.

Mr. JAMES H. EMERTON gave a very interesting communication on cobwebs. He mentioned that :

The only kinds of web made by all spiders are the egg cocoons, which in their simplest form consist of two saucer-shaped pieces fastened together at the edges. These are not made of a single thread like those of caterpillars, but of a great number of very fine threads drawn out at once, so that the cocoon cannot be unwound.

Like the cocoons are the bags which many spiders make to protect themselves during the winter or while moulting or laying eggs. A bag of this kind is made by the water spider, *Argyronata*, under water, attached to plants. The air which remains among the hairs and spinnerets when the spider comes down from above the surface collects in this bag, and finally fills it, so that the spider lives as in a diving bell.

Almost all spiders have the habit of lining their holes with silk. Some Lycosidæ dig holes a foot deep in sand, lining them with threads and fastening round the rim a ring of sticks and rubbish to prevent caving in. The trap door spiders go a step farther and make a door of web and earth fastened to the tube by a hinge at one side.

The simplest form of web for catching insects is an extension of the margin of a tube into a flat sheet made of strong threads crossed by others finer and more numerous. Of this kind are the webs of *Agalena* which cover grass fields and become visible when wet with dew. Of this kind also are the large webs of *Tegenaria* in cellars, where they are often a foot in width and remain for years.

Another kind of flat web is made by *Linyphia*. Here a thin sheet of web is held in place by threads from above and below and the spider stands underneath, holding on by its claws. *L. marginata* makes its web in the shape of a dome and stands under the highest part. The webs of *Theridion* consist of irregular threads without the flat sheet, but with a more closely woven portion as a little tent under which the spider shelters itself.

The most complicated cobwebs of all are those which consist of threads regularly arranged, part of which are adhesive. Among these we must place the webs of *Dicyna* and *Amamobius*, the adhesive threads of which are curled by a comb on the hind legs and attached to other threads previously spun. Allied to these is the web of *Hyptiotes* which consists of four radiating lines crossed by several independent adhesive threads. From this we pass to the web of *Uloborus*, the adhesive thread of which is made in the same way, but arranged in a spiral on threads radiating like the spokes of a wheel and at first held in place by a spiral of simple thread, which is taken out as it is replaced by the adhesive one.

The webs of the Epeiridæ differ from these last only in the structure of the adhesive thread, which has when spun a viscid coating which soon collects in drops along the thread. These webs are not always complete circles, many species making a number of looped threads extending only part way round, and some, as *Nephila plumipes*, always leaving a segment of the web without adhesive threads.

VICE PRESIDENT F. W. PUTNAM called the attention of the Institute to a very interesting relic which had recently been received by the Peabody Museum of Archaeology and Ethnology at Cambridge, and of which he exhibited a plaster cast. This important piece of Mexican sculpture was found about twenty years ago, in a cave near Acapulco, by Dr. Sharp, and given by him to Commodore Parker, now in command at the Charlestown Navy Yard. Within a few weeks Commodore Parker had presented it to the Peabody Museum. It is carved from a hard rock, dolerite, and has had two coats of paint, the internal of which is red and the external black, so that the natural surface of the stone is seen only on such parts as have been exposed and greatly rubbed, as is the case with the posterior surface.

The image now represents the head and neck of a man broken off just above the shoulders. That it was broken is shown by the uneven fracture and slight chippings from some of the projecting points, as if this interesting work of probably ancient Mexican art had been roughly handled either at the time of finding, of which, unfortunately, a record cannot be secured, or at an earlier period.

The great interest in the relic will be seen, at once, to centre in the peculiar manner in which this human head is dressed with the skin of the puma, or "American lion," and the remarkable resemblance which it has to the head

of the Hercules found by Cesnola at Cyprus and believed to be an Assyrian representation of the god. In each the animal's head has been drawn over the human head in such a manner as to represent the upper jaw of the lion resting on the forehead of the human head. The mere fact that an ancient Mexican god, or distinguished person, should be represented with a head-dress of the skin of the puma, or of any other animal, would in itself be of little moment, as it is well known that the skins of animals have been and still are used by several American peoples in this way; but there is in this Mexican relic an additional resemblance to the Assyrian specimen in the long, four-sided pendant hanging from the top of the head down to the shoulder just behind the left ear. What this pendant represents is difficult to say, and in the Assyrian Hercules there is one on the right side of the head also. This coincidence, added to the general resemblance in the manner in which the animal's head is drawn over the human, is certainly interesting, and seems to indicate the possibility of the origin of the idea involved and expressed one from the other, while at the same time the distinctively Mexican features are as well preserved in the one, as the Assyrian in the other, showing that while the idea may possibly have had a common origin, or have been in some way transmitted, the work of the Mexican was not a copy in very recent times. This singular coincidence is, possibly, of some importance when taken in connection with several other resemblances between old and new world productions, and the many little things which, from time to time, have been observed as indicating resemblances between the ancient nations of America with those of Egypt and Assyria, and with the oft recurring mention of the white man in the old myths of the new world.

From what I have said I beg not to be misunderstood as conveying the impression that I think there are facts

sufficient to establish a connection of the more advanced nations of America with the early civilizations of the old world, either by migration or direct or indirect intercourse, but that I simply wish to call your attention to some of the resemblances between these old peoples, which may be merely the necessary coincidences of similar periods of development of man in all places, at particular periods of the growth of nations.

Mr. JAMES KIMBALL presented, in behalf of Mr. John Conway of Marblehead, several old papers written during the period of the Revolution. Adjourned.



REGULAR MEETING, MONDAY, MARCH 19, 1877.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records read.

Mrs. J. F. Machado, of Salem, was elected a resident member.

Mr. JOHN ROBINSON gave a lecture on the fertilization of flowers by the wind and by insects.

He commenced his remarks by alluding to Sprengle, Müller, Darwin and Lubbock, and said he should confine his lecture to what these and other botanists and investigators had observed and written upon the subject.

The lecture was divided as follows :—

Definition of close, self, and cross-fertilization, and hybridization; close-fertilization considered; how close-fertilization is prevented in many plants; fertilization by wind; fertilization by insects; observations by different persons, particularly Mr. Darwin, on the effects of close and cross-fertilization.

Summary—That *self-fertilization* in many plants is

possible, and in a *few known cases* is the usual mode of reproducing the species.

That *cross-fertilization* is the *prevailing* means by which species are reproduced, and is almost absolutely necessary once in a while, to reinvigorate the species, and to keep down vagaries.

Mr. Robinson's remarks were illustrated by diagrams and blackboard sketches. A mammoth model of a pink, taken to pieces, exhibiting the various parts of the flower magnified to great size, served well to make the subject easily understood.

Mr. Robinson alluded to the kindness of Prof. Goodale of Cambridge on this and other occasions, and closed by saying the enormous reproduction of plants by seed continually going on, with the comparatively few examples of self-fertilized plants, and the overwhelming number of cross-fertilized species which have thus far been observed, proves beyond a doubt the great extent to which cross-fertilization predominates.

This renders the aid of the wind and of insects imperative; for without their agency only a small portion of our vegetation would produce healthy and abundant fruit.

Rev. E. C. BOLLES presented specimens of the new "crayontype" from crayon drawings on paper, by the photo-electrotype process invented by W. H. Mumler.

Rev. Mr. BOLLES announced the death of our associate member, Mr. E. Bicknell, who died at Lynn this morning, one of our most promising microscopists, and a very skilful preparator of microscopic specimens. On his motion a committee was appointed, consisting of Messrs. E. C. Bolles, G. A. Perkins and T. L. Perkins, to prepare a series of resolutions and to report at the next meeting.

NOTES ON THE HIRUDINEI OBSERVED IN MICHIGAN.

BY A. SAGER.¹

BUT two of the genera of this family have hitherto been observed in this vicinity, viz.: *Nephelis* and *Clepsine*; the former representing the subfamily with red blood, and the latter comprising all those that possess blood either transparent or having a slight yellow tint.

The following species of the genus *Clepsine* have been observed, most, if not all, of which appear to be non-descript, viz.:

Clepsine marmorata s. n. sp.? Body above straw-colored, marbled with brown, a mesial longitudinal band of the former extending the whole length of the body, with seven abrupt dilatations of unequal size and form, the first distinctly triangular; the margins on the dorsal surface marked with short transverse brownish bars on every third segment; numerous warty tubercles on the dorsum, somewhat in five longitudinal series. Ventral surface marked with twelve longitudinal green stripes, the margins with short transverse green bars on every third segment; margin of the posterior sucker also marked with fourteen or fifteen bars. Eyes two. Length at rest $1\frac{1}{4}$ inches, width 6 lines. Found on the *Emysaurus*, of Dum., and also *Emys marginata*.

Clepsine sex-puncto-lineata n. sp. Length from 6 to 8 lines; width from 3 to 4 lines. Color above olive brown, with the surface marked with six rows of yellow or white dots covering elevated points or tubercles, the outer rows being marginal. Beneath flesh-colored, minutely dotted with brownish or greenish points; generally

¹ Published first in the *Peninsula Journal of Medicine and the Collateral Sciences* in July, 1856.

a central clear stripe and two lateral dark ones; corresponding dark lines on the dorsum passing through or connecting a series of yellow spots. Eyes six. Ova yellow, enclosed in transparent membranous ovisacs, of which five or six were collected together, but not cohering, nor adhering to the ventral surface, but deposited on dead leaves and covered by the body of the leech. Number of ova in each ovisac varying from eight to fifty. Found May 3d, and probably deposited a few days previous.

Clepsine minima n. sp. Body flesh-colored, translucent; above delicately lined with black or dark green points. Beneath minutely and irregularly dotted with points that, under the microscope, present the usual radiated appearance of pigment cells. Length 6 lines, width $1\frac{1}{2}$ lines. Eyes two. Eggs in several ovisacs attached to the venter and carried about by the leech; color pale red. Body of leech contracted so as to enclose the ovisacs.

Of the genus *Nephele* but one clearly defined species was observed. This we believe to be the *Hirudo lateralis* of Say; of which a marked variety having numerous fawn-colored blotches on the dorsal surface, and also nearly a uniform fawn color beneath, was observed.

The ova of both genera, but especially of the *Clepsine*, afford to the embryologist a fine opportunity for studying the segmentation of the yolk, the gradual histogenic transformations, and the final development of organs, the several stages of the process occupying three or four weeks.

Not only as a process of animal building by the various stages of histogenetic and morphological transformation is the embryology of these animals peculiarly interesting, but it furnishes also an opportunity of studying the completed structure, in consequence of the transparency of

the tissues at early periods, obviating to some extent the necessity of the more difficult anatomical investigations.

In the newly completed organism of the *Nephelis* the character and course of the circulation can be distinctly traced, the wave-like contractions of the vessels being indicated by their colored blood; in the lateral vessels proceeding from behind forward on one side and downward on the opposite. I have not been able to discover the irregular movements described by some writers, now advancing and again retreating in the same vessel, at different times.

In the embryo of the *Clepsine sex-puncto-lineata* the histogenic transformation distinctly occurs at first in the superficial strata of cells, which as they change become translucent, while the interior is still composed of the minute yellow cells of the original yolk. At an early period also the number of segments of the body is but twenty-one or twenty-two, corresponding with the number of pairs of ganglia that at a little later period can be rendered visible by moderate compression. The earliest traces of the lateral coeca of the stomach appear when the yolk substance is reduced to an elongated central mass, as short yellow tubercles produced apparently by the constriction of the rudimentary stomach; they then elongate and gradually acquire the branching character of maturity. The embryo is born before the completion of the alimentary canal and without an oral orifice, but the posterior sucker is already fully developed for attachment to the body of the parent. It remains in that position until, through a more complete development, it becomes capable of an independent existence. In short the entire process of development which has been minutely traced by Grube, Weber, v. Rathke, Leuckart and others admits of more facile examination than the embryology of the

fresh-water gasteropod molluscs, and therefore to be preferred for early studies.

According to Dujardin and Owen sexual contact occurs in the warm season, especially in August, the ova being deposited in from fifteen to thirty or forty days afterwards. In Michigan the ova are deposited by both genera about the first of May and as before stated are incubated in three or four weeks. Are there not, then, at least two broods in one season?



REGULAR MEETING, MONDAY, APRIL 2, 1877.

MEETING this evening at 7.30 o'clock. The PRESIDENT in the chair. Records of last meeting read.

Rev. E. C. BOLLES, from a committee appointed at a previous meeting, reported the following resolutions:—

WHEREAS: Mr. Edwin Bicknell, for many years associated with the Essex Institute, has recently been removed by death from his labors in the cause of science; and it thereby becomes the appropriate duty of that body to place on record its appreciation of the skill and character of its lamented member; it is therefore

Resolved, That the Essex Institute has long recognized with pleasure, the merited distinction which Mr. Bicknell has attained by his profound acquaintance with the theory and practice of the microscope, and his unrivalled skill in the manipulation of that instrument, as well as in the preparation of specimens for its use;—a distinction which was as widely spread as the employment of the microscope itself, and which will always place his name among the most successful laborers in microscopic investigation.

Resolved, That his valuable services have been known and honored, not only in the Essex Institute, but also in other eminent societies of Natural History; while it was his peculiar worth which gave him a place with the first scientific teacher of our country, at the Cambridge Museum of Comparative Zoology and the Anderson School of Natural History at Penikese.

Resolved, That his unexpected decease must be regarded as a great misfortune to the practical science of our day; and that sorrow at the close of a life in the full course of such usefulness must extend beyond the immediate circle of specialists in Microscopy to all who are occupied in studying the forms of Natural History or investigating their development.

Resolved, That a copy of these resolutions be entered upon the Records of the Essex Institute at Salem, Mass., and that they be also transmitted to Mrs. Clara B. Walker of Lynn, the only surviving relative of Mr. Bicknell.

Prof. E. S. MORSE and Rev. Mr. BOLLES spoke of the late Mr. BICKNELL and of his untiring devotion to science, and the resolutions were unanimously adopted.

VICE PRESIDENT F. W. PUTNAM offered remarks on "The Development of the Ceramic Art and Ornamentation among the American Nations."

By means of blackboard drawings, specimens of pottery, and numerous photographs, Mr. Putnam illustrated the several lines of development of pottery and its ornamentation, from the earliest times to a comparatively modern period in North, Central and South America. Several early styles of ornamentation, showing similarity of design, were traced through corresponding periods of different nations, not only of America but of other parts of the world as well. He also particularly showed how the development of the "key" or "fret," which is a common pattern of ornamentation in the later period of barbarism in Central and South America, was evidently a development of the earlier "coil" pattern of South America, and not, as has been generally stated, an early form of the "curved" and "wave" pattern. He showed how much easier it was to make the coil pattern in several of its forms than the straight lines of the fret, and exhibited specimens to prove that his statement was true to the fact.

He also called attention to the interesting fact of the owl being often copied on South American and Mississippi valley pottery, as it was on that of the Old World, especially on old pottery from Etruria, and from the excavations at Hissarlik, as shown in the work of Schlie-

man. These similarities gave rise to a most suggestive discussion. Some of the specimens (belonging to the Peabody Museum, in Cambridge) shown by the lecturer were very curious and valuable. The various questions proposed by Prof. Morse, Rev. Mr. Bolles and others, which were promptly answered by the lecturer, gave a very pleasant variety to the evening, and were very instructive.



REGULAR MEETING, MONDAY, APRIL 16, 1877.

MEETING this evening. The PRESIDENT in the chair. Records read. Correspondence and donations to the Library and to the Museum were announced.

There were also exhibited collections of grasshopper eggs, taken from prairie soil in Plymouth Co., Iowa, three hundred miles west of Dubuque, received from Gen. Horace Poole of Dubuque, who thought that some of the members of the Institute would desire to observe the development of these insects, now that the matter has become of such importance as to enlist the attention of the National Government, which has just appointed a scientific commission to investigate the grasshopper pest. The President called on Prof. A. S. PACKARD, recently appointed a member of this commission, who briefly described the hatching of the eggs, and spoke of the habits and the great size of the swarms as they fly through the air. He also replied to several questions which were proposed.

The remainder of the evening was occupied by Mr. J. S. Kingsley in a lecture on the crustacea, illustrated by blackboard drawings.

Miss Ella Farman was elected a member.

REGULAR MEETING, MONDAY, MAY 7, 1877.

MEETING this evening. The **PRESIDENT** in the chair. Records read. Correspondence and donations announced.

Rev. **HENRY W. FOOTE**, of Boston, gave a very interesting and valuable historical lecture, descriptive of the church and state under Sir Edmund Andros. He first described the chief town in the colony, Boston, in those early days half a century after the first settlement of Massachusetts, and pictured the every day life and some characteristic manners and customs of the people. He then spoke of the influence and power of the clergy, drew vivid pictures of the five Boston ministers who took a prominent part in the proceedings of the period, viz.: James Allen and Joshua Moody of the First Church, Increase and Cotton Mather of the Second, and the Rev. Samuel Willard of the South Church; also of Sir Edmund Andros and others of the court party, as well as of Judge Sewall, who was spoken of as the Pepys of New England, and whose diary is soon to be published by the Massachusetts Historical Society; and closed with a description of the arrest and imprisonment of Andros, 188 years ago on the 18th of April, and imagined one of the old Puritans coming back to find the face of everything changed.



ANNUAL MEETING, MONDAY, MAY 21, 1877.

MEETING this evening at 7.30 o'clock. The **PRESIDENT** in the chair. Records read. The annual reports of the Secretary, Treasurer, Curators and Standing Committees

were read and accepted, and from them the accompanying

RETROSPECT OF THE YEAR

has been compiled, presenting the work of the Institute, in the various departments, since the last annual meeting.

MEMBERS.—Changes occur in the list of our associates by the addition of new names and the withdrawal of some by resignation, removal from the county or vicinity, or by death. Nine resident members have died, and we have received information that two of our correspondents have passed away in a serene and happy old age.

James A. Smith, of Salem, son of William and Lydia (Norwood) Smith, carpenter, died May 15, 1876, aged 58. Admitted a member March 11, 1858.

Simeon Flint, of Salem, son of Benjamin and Eunice (Stowell) Flint of North Reading, mason, died July 12, 1876, aged 59. Admitted a member April 4, 1855.

Joseph Osgood, of Peabody, son of Joseph and Mary (Beckford) Osgood of Salem, physician, died Sept. 30, 1876, aged 71. Admitted a member Jan. 29, 1851.

John Fiske Allen, of Salem, son of Edward and Ann (Fiske) Allen, merchant, died Oct. 18, 1876, aged 69. Admitted a member 1834.

John G. Felt, of Salem, son of Nathaniel and Hannah (Reeves) Felt, painter, died Nov. 14, 1876, aged 70. Admitted a member Feb. 15, 1854.

Joseph H. M. Bertram, of Salem, son of Joseph and Clara (Macintire) Millet, merchant, died Feb. 3, 1877, aged 41. Admitted a member, July 6, 1864.

William Maloon, of Salem, son of William and Abigail (Allen) Maloon, tanner, died March 13, 1877, aged 64. Admitted a member Jan. 10, 1855.

Edwin Bicknell, microscopist, died at Lynn, Mar. 19, 1877, aged 47. Admitted a member Nov. 5, 1866.

Ephraim Emmerton, of Salem, son of Jeremiah and Elizabeth (Newhall) Emmerton, merchant, died March 22, 1877, aged 85. Admitted a member 1834.

Thomas Spencer, died at Bransby, England, Sept. 4, 1876, aged nearly 84 years. A resident of Salem from 1820 to 1839.

Nehemiah Cleaveland, son of Nehemiah Cleaveland of Topsfield, died at Saugatuck, Conn., April 17, 1877, aged 80.

Short biographical notices of the above will be prepared for the Historical Collections.

MEETINGS.—During the summer, two *Field Meetings* were held. *First*, at Beachmont, on the line of the Boston, Revere Beach & Lynn Railroad, July 22, which was attended by about one hundred persons. Messrs. E. S. Morse of Salem, George Dixon of North Carolina, F. W. Putnam of Salem, George A. Otis of Washington, D.C., and D. M. Balch of Salem, addressed the meeting. *Second*, at Manchester, August 10, 1876, about one hundred and thirty present. This meeting proved to be of more than usual interest. The following gentlemen took part in the afternoon session: the President, F. W. Putnam, John Robinson, E. S. Morse, Rev. George Gleason of Manchester, Rev. James F. Clarke, R. H. Dana, jr., and Rev. C. Bartol of Boston.

Regular Meetings, twenty-five, usually on the first and third Monday evenings of each month. The following communications received and lectures delivered may be specified:—J. A. Allen, "List of Birds collected by Mr. Charles Linden near Santarem, Brazil;" E. W. Nelson, "Birds of North Eastern Illinois;" William P. Upham,

"History of Stenography, with a proposal for a new system of Phonetic Short-hand Writing;" John McNeil, "On Artificial Fish-breeding and Collateral Topics;" E. W. Nelson, "Notes upon Birds observed in Southern Illinois between July 17 and Sept. 4, 1875;" A. Sager, "Notes on the Hirudinei observed in Michigan;" F. W. Putnam, "On the Development of the Ceramic Art and Ornamentation among the American Nations;" J. H. Emerton, "On Cobwebs;" F. W. Putnam, "Remarks on a specimen of Mexican Sculpture found in a Cave near Acapulco;" J. S. Kingsley, "On the Crustacea;" H. W. Foote, a lecture descriptive "of the Church and State under Andros;" F. W. Putnam, "Remarks on a Number of Gold Images, principally from graves near Bogota, New Grenada;" John Robinson, "On the fertilization of Flowers by Wind and by Insects."

LECTURES AND CONCERTS.—A course of seven lectures under the direction of the Lecture Committee were as follows: 1st, on Tuesday, Dec. 5, 1876, by Charles Wyllys Elliott, "How the Pilgrims lived at Plymouth," illustrated by lantern pictures. 2d, on Monday, Dec. 11, 1876, by C. Pfoundes, "On Japan and the Japanese." 3d, on Tuesday, Jan. 9, 1877, by Major J. W. Powell, the U. S. Geologist in charge of the Exploration and Survey of the Colorado Region, "On the North American Indians." 4th, on Monday, Jan. 15, 1877, by Major Powell on "The Cañons of Colorado." 5th, on Monday, Jan. 29, by Prof. Henry Carmichael of Bowdoin College, "On Flame." 6th, on Monday, Feb. 12, 1877, by Prof. Alexander Graham Bell "On the Telephone." 7th, on Monday, Feb. 26, 1877, by S. G. W. Benjamin, "The Theory and Practice of Art."

Under the personal direction of the curator of Music,

seven concerts have been given. 1st, on Monday, Nov. 27, 1876, by the Mendelssohn Quintette Club. 2d, on Monday, Dec. 18, 1876, the Cæcilia Quartette of Boston. 3d, Monday, Jan. 8, 1877, by Mr. B. J. Lang and Miss Grace Sampson and Mrs. C. H. Goss. 4th, Monday, Jan. 22, 1877, by Miss Clara L. Emilio, Messrs. George W. Sumner, August Fries, and Wulf Fries. 5th, Monday, Mch. 12, 1877, by Miss Ita Welsh and others. 6th, Wednesday, Mch. 21, 1877, by Mr. H. G. Tucker and others. 7th, Wednesday, Mch. 28, 1877, by Miss Lilian Bailey and Messrs. Wulf Fries and Arthur W. Foote.

The lectures proved exceedingly instructive and compared favorably with the courses of previous years. The concerts were a very creditable series of musical entertainments of a high order of merit.

CENTENNIAL EXHIBITION.—By a vote of the directors, and in response to an invitation from a committee of the Historical Department of the Centennial Exhibition, an historical exhibit of the settlement of Salem was made in June last in Philadelphia, six portraits and many other articles of historical interest were sent. In the commissioners' report of the Historical Exhibit, the Institute is credited with having made one of the best and most carefully arranged collections in the Exhibition. The collection remained in Philadelphia, at the urgent request of the gentlemen interested, until March, when it was safely returned to Salem.

Four excursions to the Centennial Exhibition were made under the auspices of the Institute, during the months of June, September and October, and over two hundred of our citizens, including many members and friends of the Society were enabled to visit the Exhibition under favorable conditions, and at a comparatively small expense.

These excursions were under the personal direction of the Secretary and the Rev. E. S. Atwood, who took the entire charge of the last one and rendered efficient aid in carrying out the arrangements.

A pleasant gathering of members and their families was held at the rooms on the evening of the first of January. Short addresses were made by Messrs. Loring, Atwood and Bolles, on the general effect of this international exposition on the scientific and educational interests of the country. After the speaking an hour was pleasantly spent in social intercourse.

ART DEPARTMENT.—A large number of instructive and very valuable books in the various branches of art have been deposited in the rooms. Many of these volumes are rare and finely illustrated with engravings, etchings, water colors, etc. This department is receiving increased attention, and the books now on the shelves must prove of great value to the lovers of art and students who are privileged to consult them.

MUSEUM.—Many valuable specimens in Natural History, including those in Ethnology and Archæology, have been given during the year, and are on deposit with the trustees of the Peabody Academy of Science, in accordance with previous arrangements. These have been reported at our meetings, and have been duly acknowledged to several donors. The following may be specified: Royal M. Shute, Mrs. Anstiss T. Bowditch, Mrs. T. Hunt, J. L. Hammond, Miss Caroline Follansbee, Alfred Peabody, W. R. Cloutman, Miss Ann Smith, Alfred S. Peabody of Cape Town. In addition to these several interesting specimens of an historical character have been arranged in the rooms, and contribute very much of interest and

value to the antiquarian and historical portion of the Museum. The following donors may be specified: J. F. Wood, Geo. A. Perkins, W. R. Cloutman, Mrs. G. W. Estes, T. F. Hunt, Mrs. Lewis Titcomb, W. J. Foster, W. P. Upham, James Kimball, David Pingree, M. A. Stickney, S. G. Henderson, Daniel C. Bowditch, Miss Martha Whipple, Mrs. N. D. Cole, Miss Kate Johnson, John J. Dennis of Beverly, Miss Mary Ellen Briggs, Miss E. Wheatland, F. Lamson, Miss Rebecca Wallis, James A. Chamberlain, Miss Martha G. Wheatland, S. B. Ives, C. C. Perkins, and Miss Harriet King. To the collection of the fine and industrial arts many contributions have been received, some of exceeding value from the completeness of the series, especially that from J. L. Hammond and Edward L. Wilson of Philadelphia, the former of the textile manufactures of China, the latter some 700 unmounted Photographs of the Centennial Exhibition. E. C. Bolles, J. W. & J. S. Moulton, James C. Stimpson, J. J. Latting of New York, George Perkins, J. H. Emerton, Thomas A. Taylor, Mrs. J. P. Cook, J. P. Peabody, and John Robinson were also contributors.

The Eastern anteroom, in which many of the above collections are arranged, has been thoroughly renovated, the walls neatly tinted, the portraits and historical pictures have been cleaned and hung, the cabinets rearranged and the various specimens labelled. The room is now in good order.

HORTICULTURAL.—The annual exhibition opened on Tuesday evening, Sept. 12, 1876, and continued to the Friday evening following. The display was much better than had been anticipated, considering the season. The vegetables from the Plummer School Farm and from Baker's Island were worthy of particular mention. The hot

house plants from Mrs. C. Hoffman, the ferns from Mr. John Robinson, the gladioli from Mr. C. A. Putnam, the floral exhibit from A. H. Dunlap of Nashua, and many others, attracted great admiration.

The contributors were as follows :—*Apples*, Charles A. Ropes, C. H. Buxton, Charles M. Richardson, George Chambers, Mrs. E. H. Valentine, James P. Cook, Caleb Foote, Andrew E. Elliott, Miss Belle Leavitt, John G. Waters, and Aaron Nourse. *Pears*, James P. Cook, Miss E. P. Richardson, W. H. Dennett of Beverly, George Bowker, Aaron Nourse, Andrew E. Elliott, T. P. Symonds, Charles A. Ropes, Joseph A. Goldthwaite, Charles M. Richardson, Caleb Foote, Miss Martha G. Wheatland, David Roberts, George Chambers, C. H. Buxton, Dorcas Nourse, Mrs. W. F. Gardner, Mrs. Walter Leavitt, and Miss Belle Leavitt. *Peaches*, George Bowker, C. M. Richardson, Miss Lizzie Goldthwaite, and Mrs. John Barlow. *Grapes*, T. P. Symonds, Miss E. P. Richardson, George Russell, Joseph A. Goldthwaite, Andrew E. Elliott, Charles B. Fowler, J. Fiske Allen, Thorpe Fisher, Jos. T. Fuller, A. Nourse, George A. Perkins, Mrs. Walter Leavitt, George Bowker and Miss Belle Leavitt. *Plums*, Mrs. Wm. G. Kilham. *Vegetables*, J. H. Sears of Danvers, C. A. Johnson of Plummer Farm School, T. G. Gilbert of Baker's Island, and W. H. Dennett of Beverly. *Pot Plants*, Mrs. Charles Hoffman, John Robinson, and George F. Sheldon. *Flowers*, A. H. Dunlap & Son of Nashua, N. H., Mrs. L. P. Weston of Danvers, Charles A. Putnam, Miss Martha Horton, Mrs. W. F. Gardner, Miss Bessie Safford, Miss Lizzie Sanborn, Miss A. W. Kimball, John Robinson, Mrs. Charles Osgood, Miss Mary A. Ropes, and John Webster. *Miscellaneous*, Mrs. W. F. Gardner, Orrin Weston, Miss Anna Frye, Miss Dorcas Nourse, Mrs. C. Osgood, and George Russell.

LIBRARY.—During the year the following additions have been received :—

By Donation.

Folios,	30	Pamphlets and Serials, . . .	10,995
Quartos,	46	Almanacs,	15
Octavos,	379		
Duodecimos,	229	Total,	11,010
Sexdecimos,	21	Total of bound volumes, . .	705
Total of bound volumes, . .	705	Total of Donations, . . .	11,715

By Exchange.

Quartos,	3	Pamphlets and Serials, . . .	1,371
Octavos,	87	Total of bound volumes, . .	97
Duodecimos,	7		
		Total of Exchanges, . . .	1,468
Total of bound volumes, . .	97	Total of Donations, . . .	11,715
By Purchase,			18
Total of Additions,			13,201

Of the total number of pamphlets and serials, 7,930 were pamphlets, and 4,436 were serials.

The donations to the Library for the year have been received from 129 individuals and fourteen societies and departments of the General and State Governments. The exchanges from 113 societies and incorporate institutions, of which sixty-six are foreign; also from editors and publishers.

The library has been carefully examined and found in good order and condition. The work of preparing the material for a catalogue is being carried on by the Assistant Librarian. A printed catalogue would be a very great convenience and is very much needed, but would require a greater expense than can at present be afforded.

Donations or exchanges have been received from the following :—

	Vols.	Pam.
Abbot, F. E., Boston, Mass.,	3	
Agassiz, A. E. R., Cambridge, Mass.,		14
Allen, S. M., Boston, Mass.,	1	

	Vols.	Pam.
American Association Advancement of Science,	1	
Anagnos, M., Boston, Mass.,		1
Andover (Mass.) Theological Seminary,		1
Appalachian Mountain Club,		2
Atkinson, Miss L. D.,		6
Atwood, Rev. E. S.,		52
Augsburg Naturhistorischer Verein,	1	
Baker, C. H., Annapolis, Md.,		1
Baltimore, Peabody Institute,		2
Batavia, Societe des Arts et des Sciences,		7
Belfast Naturalist Field Club,		2
Bemis, Luke, West Chester, Pa.,	1	
Berlin, Gesellschaft Naturforschende,	1	
Berlin, Verein zur Beförderung des Gartenbaues,	1	
Berlin, Zeitschrift für die gesammten Naturwissenschaften,		2
Bern, Naturforschende Gesellschaft,		2
Berwickshire Naturalist Club,		1
Boardman, S. L., Augusta, Me.,	3	
Bolles, Rev. E. C.,	9	82
Bologna, Reale Accademia delle Scienze,	1	
Bonn, Naturhistorischer Verein der preussischen Rhein- lande und Westphalens,		2
Boston, American Academy Arts and Science,		1
Boston Athenæum,	1	
Boston, City of,	13	
Boston, Congregational Library Association,		63
Boston Public Library,		4
Boston Society of Natural History,		9
Boynton, N., Estate of,	6	
Braunschweig Archiv der Anthropologie,		2
Brazil Centennial Commission,	3	
Bremen, Naturwissenschaftlichen Vereine,		2
Briggs, Daniel C.,	1	
Briggs, Miss M. E.,	4	
Bristol Naturalist Society,		1
Brooks, Henry M.,	6	
Brooks, W. G., Boston, Mass.,		15
Brown, A., Boston, Mass.,		2
Brünn, Naturforschender Verein,	1	1
Bruxelles, Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique,	5	
Bruxelles, Société Entomologique,		2
Bruxelles, Société Malacologique,		8

	Vols.	Pam.
Buffalo Historical Society,	13	
Buffalo Society of Natural Sciences,		2
Buffalo Young Men's Association,	2	4
Caen, Académie Royale des Sciences, Arts et Belles-Lettres,	1	
Cambridge, Museum of Comparative Zoology,		3
Canada Geological Survey,	1	
Canadian Institute,		5
Cassino, S. E.,	1	
Chamberlain, J. A.,	2	28
Chaney, Rev. G. L., Boston, Mass.,		2
Chemnitz, Naturwissenschaftlichen Gesellschaft,		2
Cherbourg, Société Nationale Sciences Naturelles,	1	
Childs, E. V., Newton, Mass.,	1	
Cloutman, W. R.,	1	
Colby University, Waterville, Me.,		1
Cole, Mrs. N. D.,		12
Connecticut Academy Arts and Sciences,		1
Crosby, Mrs. M. K.,	22	8821
Currier, John J., Newburyport, Mass.,		1
Cutter, A. E., Charlestown, Mass.,		1
Dale, T. Nelson, Jr.,		1
Danzig, Naturforschende Gesellschaft,		1
Davenport, Iowa, Academy Natural Science,	1	
Dawson, C. C., New York,		1
Dresden, Naturwissenschaftliche Gesellschaft "Isis,"		1
Durrie, Dan'l S., Madison, Wis.,	2	
Emdem, Naturforschende Gesellschaft,	1	
Emilo, L. F., San Francisco, Cal., Newspapers.		
Emmerton, James A.,		250
Erlangen, Physikallisch-medicinische Societat,	1	1
Falmouth, Eng., Royal Cornwall Polytechnic Society,		1
Farley, E. W.,		1
Fitch, O. H., Ashtabula, O., Newspapers.		
Follansbee, Miss C. L.,	12	
Foots, Caleb, Newspapers,	1	
Foster, William H.,		168
Frankfurt, Zoologische Gesellschaft,		5
Georgia Historical Society,	8	8
Geneve, Institut National Genevois,	1	
Geneve, Société de Physique et d'Histoire Naturelle,		1
Goodell, A. C., Jr.,		189
Goss, E. H., Melrose,		2
Gottingen, Konigliche Gesellschaft der Wissenschaften,	1	

	Vols.	Pam
Gravenhague, Entomological Society,		2
Green, S. A., Boston, Mass.,	13	170
Hale, R. S.,		1
Hamburg, Naturwissenschaftlicher Verein,	2	1
Hart, C. F., Philadelphia, Penn.,		15
Hartranft, John F., Philadelphia, Penn.,	1	
Harvard College,		2
Haskell, Geo., Ipswich, Mass.,		2
Hayward, Rev. S., Gillsburg, N. H.,		1
Hewes, Rev. J. T., Fitchburg, Mass.,	1	2
Hunt, Mrs. T.,	3	1
Hunt, T. F.,	93	91
India Geological Survey,		9
Indiana Geological Survey,		1
Ives, H. P.,	1	
Ives, S. B.,	27	78
Jameson, P. H.,		2
Jenison, O. A., Lansing, Mich.,		12
Johnson, Rev. Sam'l,	14	
Johnson, Thos. H.,	3	
Kansas Historical Society,		1
Kimball, James, Newspapers, x,		8
Kingsley, J. S., Newspapers,		2
Kjobenhavn, Kongelige Danske Videnskabernes Selskab, .	3	
Königsberg, Königliche Physikalisch-Oekonomische Gesell- schaft,		2
Lander, Miss E. B.,	8	
Lausanne, Société Vaudoise des Sciences Naturelles, .		1
Lawrence, Abbott, Boston,	1	
Lee, John C., Newspapers.		
Leeds Philosophical and Literary Society,	1	
Le Mans, Société d'Agriculture, Sciences et Arts de la Sarthe,	1	2
Lincoln, F. H., Boston,		6
Liverpool, Literary and Philosophical Society,	1	
London, Royal Society,		11
Lyon, Société d'Agriculture, d'Histoire Naturelle et des Arts utiles,	2	
Lyon, Société Linnéenne,	2	
Mack, Miss E. C.,	6	
Mack, William,	39	88
Madrid, Observatorio,	8	
Manchester Literary and Philosophical Society,	5	

	Vols.	Pam.
Mannheim, Verein für Naturkunde,		4
Manning, R. C., Newspapers, xc,	7	
Manning, Robert,		20
Marburg, Gessellschaft zur Beförderung der Gesammten Naturwissenschaften,		2
Massachusetts Historical Society,	2	
Massachusetts Horticultural Society,		1
Maryland Historical Society,		3
Mecklenburg Vereins der Freunde,	1	
Merritt, Mrs. L. F., Newspapers.		
Miller, Misses,	138	196
Mills, Rev. R. C.,		9
Minnesota Historical Society,	1	3
Morse, Edward S.,		286
Munchen, Königlich Bayerischen Akademie der Wissen- schaften,		25
Munsell, Joel, Albany, N. Y.,	3	40
Nelson, H., Georgetown, Mass., Newspapers.		
Neuchatel, Société des Sciences Naturelles,		2
New England Historic-Genealogical Society,		5
Newhall, Thomas A., Germantown, Penn.,	6	
New Haven Historical Society,	1	
New Jersey Historical Society,		1
New York, American Geographical Society,		1
New York Chamber of Commerce,	1	
New York Genealogical Biographical Society,		3
New York Mercantile Library,	1	1
Norris, Chas. H.,		1
Northey, Wm.,		49
Nourse, Miss D. C.,	5	
O'Donnell, John,		1
Ohio Historical and Philosophical Society,		2
Oliver, S. C.,	3	36
Orange, N. Y., New England Society,		1
Osgood, Chas. S.,	3	
Ourt, A. J., Harrisburg, Penn.,	1	
Packard, A. S., Jr.,		2
Packard, P. W.,		1
Palfray, C. W., Newspapers,	1	59
Paris, Institut Historique,		6
Paris, Journal de Conchyliologie,		4
Paris, Société d'Acclimation,	1	
Paris, Société d'Anthropologie,		3
Peabody, Alfred,		1

	Vols.	Pam.
Peabody, Peabody Institute,		1
Pennsylvania Historical Society,	1	1
Perkins, A. C., Exeter, N. H.,		1
Perkins, A. T., Boston, Mass.,		1
Perkins, Geo.,		49
Perkins, Geo. A.,	2	
Perkins, Samuel C., Philadelphia, Penn.,		2
Perley, M. V. B., Springfield, Mass.,	1	
Perry, Rev. W. S., Geneva, N. Y.,		7
Philadelphia Academy Natural Science,		1
Philadelphia, American Philosophical Society,		3
Philadelphia Carpenter's Company,	1	1
Philadelphia Zoological Society,		1
Phippen, Geo. D.,	24	19
Pool, W., Wenham,		2
Portuguese Centennial Commission,		4
Putnam, Rev. A. P., Brooklyn, N. Y.,		2
Putnam, Mrs. E. A., and F. W.,	62	714
Putnam, H. W.,	8	83
Quincy, Edmund, Quincy,	1	
Regensburg, Königl. Bayerische botanische Gesellschaft,	1	
Rhode Island Historical Society,	2	22
Robinson, John,		177
Sacken, C. R. O., Newport, R. I.,		1
Salem, City of,	1	
Salem, Ladies' Centennial Committee,	5	
Salem Young Men's Christian Association, Newspapers,		
Saltonstall, L., Boston, Mass.,		10
Sanborn, Geo.,	5	75
Scudder, Samuel H., Cambridge,		2
Sewall, Rev. C. C., Medfield, Mass.,		1
Skinner, Mrs. R.,	1	
Smith, G. W.,	1	
Smith, Mrs. S., Pembroke, Mass.,	1	
Smithsonian Institution,	5	3
Smucker, Isaac, Newark, Ohio,	1	
Spofford, A. R., Washington, D.C.,	1	1
St. Gallen, St. Gallische Gesellschaft,		1
Stickney, M. A.,	1	11
St. Louis Academy Science,		1
Stockholm, Kongliga Svenska Vetenskaps-Akademien,	8	
Stone, B. W.,	2	
Stone, Rev. E. M., Providence, R. I.,		1
Story, Augustus,	48	95

	Vols.	Pam.
Story, Miss E. A.,	1	
St. Petersburg, Imperat Akademya Nauk,		13
Tasmania Royal Society,	1	
Tenney, Mrs. H. A., Lansing, Mich.,		1
Thompson, C. P., Gloucester,	13	
Trowbridge, Thos. R., New Haven, Conn.,	1	
Tucker, Jona.,		6
Upham, Wm. P.,		1
Upsal, Kongliga Vetenskaps-Societeten,		2
U. S. Bureau of Education,	11	88
U. S. Bureau of Statistics,	12	
U. S. Dept. of Interior,	38	2
U. S. Dept. of State,	5	1
U. S. Engineer Dept.,	8	
U. S. Navy Dept.,	8	
U. S. Patent Office,		36
U. S. Treasury Dept.,	1	
Vermont Historical Society,	2	
Very, Miss L. L. A.,	1	
Victoria Centennial Commission,	8	5
Waterbury, Conn., Bronson Library,		2
Waters, E. Stanley,		65
Waters, Joseph Linton,		6
Watson, Miss C. A.,	1	
Welsh, Wm. L.,	2	15
Wheatland, Miss M. G.,		20
Wheatland, Stephen G.,	22	48
White, Rev. W. O., Keene, N. H.,		1
Wien, K. K. Zoologische botanische Gesellschaft,	1	
Williams, Henry L.,		80
Williams, James, Columbus, O.,	1	
Willson, Rev. E. B.,	1	
Winthrop, Robert C., Boston, Mass.,		3
Wisconsin Academy of Science, Arts and Letters,	1	
Wisconsin Historical Society,		1
Wisconsin Natural History Society,		1
Woodbridge, W. E.,	1	
Woods, Mrs. K. T.,	1	
Worcester, American Antiquarian Society,		2
Worcester Free Institute,		1
Worcester Society of Antiquity,		1
Wurzburg, Physikallisch-medicinische Gesellschaft,		4
Zurich, Naturforschende Gesellschaft,		1

The following have been received from editors or publishers :—

American Journal of Education.	Lynn Reporter.
American Journal of Science.	Lynn Transcript.
American Naturalist.	Nation.
Beetle and Wedge.	Nature.
Boston Globe.	Peabody Press.
Bradford New Era.	Peabody Reporter.
Dexter Smith's Paper.	Quaritch's Catalogue.
European Mail.	Sailors' Magazine and Seamen's Friend.
Forest and Stream.	Salem Gazette.
Gardener's Monthly.	Salem Observer.
Hardwicke's Science Gossip.	Salem Post.
Haverhill Gazette.	Salem Register.
Ipswich Chronicle.	Turner's Public Spirit.
Lawrence American.	Vox Humana.
Lynn City Item.	

PUBLICATIONS have been issued as heretofore,—the BULLETIN, vol. 8, and the HISTORICAL COLLECTIONS, vol. xiii, Nos. 3 and 4. The exchange list, with few exceptions, continues the same as last year. A new price list of the Publications has been printed and distributed to the prominent libraries, historical societies, colleges, and also to booksellers throughout the country. The By-Laws, adopted at the close of the preceding year, have been printed in a convenient form for reference and the use of members.

FINANCIAL.—The Treasurer's Report shows an increase in the annual income, yet additional means are requisite to perform the various duties, which are reasonably expected, in a fitting manner.

DEBITS.

General Account.

Athenæum, for Rent and Librarian,	\$350 00
Salaries, \$745.00; Coal, \$140.00; Gas, \$51.96,	936 96
Lectures, \$87.87; Publications, \$1,134.90,	1,222 07

Express and Postage, \$81.46; Insurance, \$40.00; Binding, \$23.00,	143 46
Excursions, \$4,902.38; Sundries, \$144.85; Stationery, 25.63,	5,073 91
Secretary, 1875 to 1877,	1,690 00
	<hr/>
	\$9,415 40
Balance in hands of Treasurer,	7 85

Historical.

Books,	52 00
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Ditmore Fund.

Deposited in Five Cents Savings Bank,	\$1 000 00
Note receivable,	1,100 00
Paid F. S. Perkins,	128 64
	<hr/>
	2,228 64
	<hr/>
	\$11,703 89

CREDITS.

General Account.

Dividends Webster Bank,	\$20 00
Assessments, \$1,112.00; Publications, \$430.05,	1,542 05
Sundries, \$1.00; Life Memberships, \$60.00,	61 00
Athenaeum, proportion of coal and janitor,	158 44
Excursions, \$5,540.65; Lectures and Concerts, \$319.63,	5,860 28
Subscriptions for Secretary's Salary,	1,225 00
	<hr/>
	\$8,866 77
By Balance,	65 85

Historical.

Dividends Naumkeag Bank,	16 00
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Natural History and Horticulture.

Dividends P. S. & P. R. R.,	\$12 00
Dividends Lowell Bleachery,	32 00
Horticultural Exhibition,	32 63
	<hr/>
	\$76 63

Davis Fund.

Coupons Burlington and Missouri R. R.,	140 00
Coupons Dixon, Peoria and Hannibal R. R.,	240 00
	<hr/>
	380 00

Ditmore Fund.

Coupons Chicago City Bonds,	70 00
Executor of Miss Ditmore's Estate,	2,096 78
Interest received,	131 88
	<hr/>
	2,298 64
	<hr/>
	\$11,703 89

The routine work of the Institute has prospered favorably, and considerable amount has been done in preparing a large quantity of printed matter relating to the Centennial Exhibition for binding. The Ladies' Centennial Commission of Salem, by a generous money contribution, has enabled the society to purchase and place in the library, for reference, many valuable books, pamphlets, photographs, maps, catalogues, etc.

The following officers were then elected, until others shall be chosen in their stead:—

PRESIDENT:

HENRY WHEATLAND.

Vice-Presidents:

ABNER C. GOODELL, Jr.

WILLIAM SUTTON.

FREDERICK W. PUTNAM.

DANIEL B. HAGAR.

Secretary:

GEORGE M. WHIPPLE.

Treasurer:

HENRY M. BROOKS.

Auditor:

RICHARD C. MANNING.

Librarian:

WILLIAM P. UPHAM.

CURATORS:

History—JAMES KIMBALL.

Manuscripts—W. P. UPHAM.

Archæology—F. W. PUTNAM.

Numismatics—M. A. STICKNEY.

Geology—ALPHEUS S. PACKARD, Jr.

Botany—GEORGE D. PHIPPEN.

Zoology—EDWARD S. MORSE.

Horticulture—CALEB COOKE.

Painting & Sculpture—T. F. HUNT.

Technology—EDWIN C. BOLLES.

Music—ARTHUR W. FOOTE.

COMMITTEES:

Finance:

JOHN C. LEE. JAMES UPTON. JAMES O. SAFFORD. H. M. BROOKS.

Library:

CHAS. W. PALFRAY.

JOSEPH G. WATERS.

HENRY F. KING.

GEORGE F. FLINT.

WM. NEILSON.

Publications:

ABNER C. GOODSELL, Jr. EDWARD S. ATWOOD.
EDWIN C. BOLLES. JAMES KIMBALL. T. F. HUNT.

Lectures:

WILLIAM D. NORTHERD. A. H. JOHNSON. F. W. PUTNAM. A. L. HUNTINGTON.

Field Meetings:

GEO. COGSWELL, Bradford.	LEWIS N. TAPPAN, Manchester.
GEORGE D. PHIPPEN, Salem.	FRANCIS H. JOHNSON, Andover.
GEORGE PERKINS, Salem.	R. S. SPOFFORD, Newburyport.
M. N. WALTON, Salem.	N. A. HORTON, Salem.
FRANCIS H. APPLETON, Peabody.	

Messrs. Fielder Israel and Joshua Phippen, jr., both of Salem, were elected resident members. The President read a letter from Rev. R. M. Chipman of Lisbon, Conn., suggesting the propriety of a celebration in Sept., 1878, the 250th anniversary of the landing of Gov. Endicott. Referred to the President and Messrs. Kimball and Upham.

MONDAY, MAY 28, 1877.

An adjournment of the annual meeting was held this evening. The PRESIDENT in the chair. The unfinished business was considered and acted upon.

The Secretary read a letter from Mrs. Anna C. Warren of Boston, donating to the Institute an oil painting of Daniel Webster. Mr. Hunt mentioned that he had seen the painting, which was a fine copy, by Miss Jane Stuart, from the original. The thanks of the Institute were tendered to Mrs. Warren for her liberal donation.

REGULAR MEETING, MONDAY, JUNE 4, 1877.

MEETING this evening. The PRESIDENT in the chair. Records read. Correspondence and donations announced.

Messrs. George E. Merrill, James A. Emmerton and Charles H. Flint, of Salem, and H. B. Craine, of Amesbury, were elected members.

The PRESIDENT mentioned that Mr. James Kimball had found among the papers in the Court House a map of Merrimack River from Haverhill to the source, drawn by John Gardner, supposed to be original. A paper for the HISTORICAL COLLECTIONS, giving a full account of the same with accompanying documents is in preparation.

ADDITIONS TO THE FERNS OF ESSEX CO., MASS.

(Bulletin, March, 1875, and Addenda, Oct., 1875.)

NEW LOCALITIES.

WOODWARDIA ANGUSTIFOLIA Sm. Magnolia Swamp, June, 1877. J. H. Sears and J. Robinson.

PHEGopteris HEXAGONOPTERA Fée. Chebacco woods, Aug., 1876. J. H. S. and J. R.

OPHIoglossum VULGATUM L. Boxford, 1876-7. J. R.

LYCOPODIUM INUNDATUM L. Plum Island, and near Coffin's Beach, Gloucester (very fine).

SPECIES NEW TO LIST.

BOTRYCHIUM LANCEOLATUM Angs. Near Georgetown, Aug. 11, 1876. Mrs. Horner.

ASPIDIUM CRISTATUM var. CLINTONIANUM Eaton. Danvers, June, 1877. J. R. and J. H. S.

CORRECTION.

For ISOETES ECHINOSPORA var. BRAUNII read the same species var. MURICATA.

We have now in the herbarium of the Peabody Academy of Science the completed collection of Ferns, Equisetums and Lycopods of the County.

JOHN ROBINSON.

Salem, June 30, 1877.

BULLETIN

OF THE

ESSEX INSTITUTE.

VOL. 9. SALEM, JULY, AUG., SEPT., 1877. Nos. 7, 8, 9.

FIELD MEETING AT BOXFORD, TUESDAY, JUNE 26, 1877.

THE members and their friends assembled at the chapel of the village church in Boxford about 10.30, A. M., and after a cordial welcome from a committee of the citizens, dispersed in groups for the ramble in search of plants, insects and other objects of interest. A gentle rain at noon interfered with the collecting of specimens, yet several were obtained.

The afternoon session was called to order at 2 o'clock, the Secretary reading the records of the last meeting, and the President opening the proceedings with a general statement of the objects of the Institute, particularly that feature of the institution which treasures facts and papers pertaining to the civil or natural history of the county.

Mr. WILLIAM P. UPHAM, of Salem, gave some account of the old elm tree on the James M. Hubbard place in North Andover close to the Boxford line, which measured this day, six feet from the ground, 18 feet 10½ inches in circumference, having increased since 1858 [at that time

measured by him], fourteen inches. The ordinary estimate of the age of a tree of this kind is about an inch of circumference for a year, and upon this basis, this elm must be over 200 years of age. Mr. Upham also spoke of the elm tree at Mrs. Isaac Hale's in Boxford, which six feet up measured in circumference 12 feet 8 inches, and the spread 107 feet 6 inches in diameter, and is probably not surpassed in general beauty and symmetry by any in the county. He also alluded to other trees and exhibited drawings of several.

Some further remarks upon large trees were made by Mr. John Robinson, Rev. William S. Coggin and others.

REV. E. C. BOLLES, of Salem, had made no collections, and was consequently not prepared to offer anything in his own particular department of scientific investigation. He, however, had something to say growing out of the thought that often in the most limited things in nature are revealed the wonders of a world, and about specialty in science with particular reference to enforcing the idea that there is not a person in any of these towns who is not capable of contributing something to the world's store of knowledge.

ANCILL DORMAN, Esq., one of the selectmen, on being called upon to say something pertaining to the history of the town, said the original settlement dated back as far as 1650. In 1680 there were twenty or thirty families. It was incorporated in 1685, the land being previously a part of Rowley, the early settlers coming from Topsfield and a part from Ipswich. At the time of the Revolution there were about 1000 inhabitants, and this is about the present population. The church in this parish was founded in 1702; and that in the west parish in 1736.

Mr. JAMES H. EMERTON, of Salem, spoke of the manner in which the cocoons of spiders are made, and described the methods followed by *Epeira strix* and *Attus mystaceus*. The first makes a ball of loose wrinkled silk, lays its eggs in it and covers the whole thickly with strong threads. The *Attus* makes first a large silken bag in which it lives for some time. Finally it discharges the eggs against the upper surface of the bag, where they adhere and are immediately covered by fine silk. Mr. Emerton showed a cocoon of *Epeira caudata* found on a berry bush in the pine woods; also several female *Lycosa* carrying their cocoons fastened to their spinnerets.

Dr. GEORGE A. PERKINS, of Salem, described the sundew (*drosera*), and spoke of several other plants of the same habits.

Mr. JOHN ROBINSON, of Salem, followed with a more detailed account of these plants, including the pitcher plant, with habits similar to those of the *drosera*. The peculiarity of this class of plants which received particular attention were those trap-like appliances by which they catch and hold insects which die, decay, and serve as a fertilizer to nourish the plant. Mr. Robinson described a number of plants that had been collected by Mrs. Horner of Georgetown.

Mr. JOHN ROBINSON, in reply to a question which was proposed on the subject of planting pine trees, explained the structure of the pine cone, the position of the seed therein, time and manner of sowing, alluding briefly to the diminution of our forests. On this latter subject a discussion followed, Mrs. C. H. Dall and Mrs. Mary S. Blake of Boston and the Rev. Messrs. Israel and Bolles of Salem and others taking part.

Rev. SERENO D. GAMMELL, of Boxford, in this connection, called attention to the consideration that pines when arrived at maturity ought to be cut. There are citizens here in Boxford who have tilled land where there are trees now growing. There are more trees in Boxford than there were some years ago; and with us the evil of cutting down trees carries its own remedy. There are not so many acres of large timber, but more of wood growth.

After some additional remarks, Mr. N. A. HORTON, of Salem, spoke of the spirit of hospitality which characterized the Boxford people, and offered a resolve "that the cordial thanks of the Essex Institute be tendered to Rev. Mr. S. D. Gammell and wife, to Rev. William S. Coggin, to Miss Coggin and to other citizens of the town of Boxford, for many kind attentions received this day; and also to the proprietors of the congregational church, for the use of the church and chapel."

This resolution was unanimously adopted and the meeting adjourned.



REGULAR MEETING, MONDAY, JULY 2, 1877.

MEETING this evening. The PRESIDENT in the chair. Mr. JOHN ROBINSON was elected Secretary *pro tem*. Records read.

Isaac J. Osburn, of Salem, was elected a resident member.

AN EXAMINATION OF TYPES OF SOME RECENTLY
DESCRIBED CRUSTACEA.

BY T. HALE STREETS, M.D., AND J. S. KINGSLEY.

THE PEABODY ACADEMY OF SCIENCE having received from Mr. W. N. Lockington, of San Francisco, some of the types of the Crustacea described by him in the "Proceedings of the California Academy of Sciences," we have thought it best to place on record the results of our study of the specimens, especially since many of his new genera and species would be, without his labels, impossible to identify. We have only "Author's extras," and so cannot quote the volume and page of his descriptions.

Microphrys platysoma A. M. Edw. *Milnia platysoma* Stimpson, Annals N. Y. Lyceum Nat. Hist., vii, p. 180. *Pisoides? celatus* Lockington, Proc. Cal. Acad., July 17, 1876.

Of this species we have two specimens. The two spines on the branchial region are close together.

Midrophrys depressa Streets & Kingsley. *Fisheria depressa* Lockington, l. c., July 17, 1876.

This species differs from *M. platysoma* in having the digits excavate at the extremity, in being more granulated, in having the laminiform process on the branchial region somewhat imbricated. There is a spine between and below the processes on the branchial and hepatic regions and three spinous tubercles beneath the hepatic process, on the infero-lateral portion. The posterior margin of the carapax has a row of bead-like tubercles as in *M. platysoma*. The laminiform processes on the propodal joints of the

ambulatory feet are as in *M. platysoma*. Mr. Lockington was apparently led to separate this from his *Pisoides? celatus* by working with the synopsis of genera given in Dana's Crustacea of the U. S. Exploring Expedition where the Maiidæ are divided into two groups according as the digits are acuminate or excavate. Mr. Lockington's generic description would totally mislead one in this instance, but his specific is tolerably good. In the specimen sent (a male), however, the chelipeds are not "enormously long," but are fully as short proportionally as in *Microphrys bicornuta* of Florida.

Thoe sulcata Stm., Ann. Lyc., vii, 177. *Platypes edentata* Lockington, l. c., March 20, 1876; *id.*, July 17, 1876.

The specimens sent are plainly *Thoe sulcata*. Contrary to the generic diagnosis given by Mr. Lockington, the rostrum is bifid and the preorbital is prominent.

Othonia Picteti de Saussure, Revue et Magazin de Zoologie, 1853, II, v, 357, pl. XIII, f. 2; Stimpson, Journal Boston Society Nat. Hist., vi, p. 455. *Micippa ovata* Lockington, l. c., July 17, 1876.

The specimens sent agree exactly with Saussure's description and figure, and certainly do not belong to the genus *Micippa*.

Mithraculus areolatus? S. & K. *Mithrax areolatus* Lockington, l. c., July 17, 1876.

This is plainly a *Mithraculus*, but whether it be new or not we cannot say, as we have not Bell's description of *M. denticulatus* at hand. It is not *M. coronatus* Stm. nor *Mithrax armatus* Saussure.

Inachodes Hemphilli Lockington, l. c., Feb. 7; *id.*, July 17, 1876.

The specimens sent are very near *I. lævis*, but differ from Stimpson's description in having a spiniform tubercle on the gastric region; the dactyli are flattened and curved

but not enough to call falciform ; the rostrum is regularly tapering. The proportions of the carapax are also different, the length being to the breadth as three to two. The modification of the diagnosis of the genus proposed by Mr. Lockington cannot be allowed, as the postocular is present though small.

Inachodes brevirostrum Lockington, l. c., July 17, 1876.

A single dry specimen of this apparently good species was received.

Epialtus minutus Lockington, l. c., July 17, 1876.

This apparently new form differs greatly from the other species of the genus with which we are acquainted.

Anaptychus cornutus Stm., Ann. Lyc., vii, 184, pl. II, f. 1. *Ala spinosa* Lockington, l. c., July 17, 1876.

The specimens in no way differ from the description and figure quoted above.

Atergatis rotundatus Stm., Ann. Lyc., vii, p. 202. *Atergatis cristatissimo* Lockington, l. c., March 20, 1876; *id.*, Sept. 4, 1876.

One specimen received.

Xanthodius Sternberghii Stm., Ann. Lyc., vii, p. 52. *Actæodes mexicanus* Lockington, l. c., May 20 and Sept. 4, 1876.

The two specimens sent agree with Stimpson's description and with specimens in the Museum of the Academy from Panama. Mr. Lockington had the paper of Stimpson's quoted above.

Xanthodes Taylora Stm., Ann. Lyc., vii, p. 208, pl. V, f. 3. *Xantho spini-tuberculatus* Lockington, l. c., Feb. 7 and Sept. 4, 1876.

The single specimen agrees perfectly with Stimpson's description and figure.

Panopeus purpureus Lockington, l. c., Sept. 4, 1876.

Is very near *P. validus* Smith, but the front is not as

prominent and less sinuate than in specimens in the Peabody Academy identified by Prof. Smith. There is also a crest on the upper portion of the propodus while in *P. validus* this crest is obsolete. The ambulatory feet are also less hairy and more nearly cylindrical.

Panopeus affinis Streets & Kingsley. *Panopeus transversus*? Lockington, l. c., Sept. 4, 1876 (non Stimpson)

Is very near *P. transversus* Stm. and *P. crenatus* Edw. & Lucas, but has the rostrum more nearly rectangular than in either, and as prominent as in the latter. The front is bilobed, the lobes being slightly arcuate, truncate, not sinuate. A sulcus on the rostrum near the orbits. Orbits with two obsolete fissures above. The notch between front and orbits as in *transversus*. The surface of the carapax is uneven near the antero-lateral teeth, being crossed by grooves running inward from the emarginations between the teeth. There is also, as in *P. crenatus*, slight indications of a separation of the angle of the orbit from the second normal tooth. The sub-hepatic regions are granulate as in *P. transversus*. The spine on the inner margin of the carpus occupies a median position instead of being near the distal extremity as in both species with which this has been compared.

Chlorodius Fisheri Lockington, l. c., Sept. 4, 1876.

This species is probably new, but as the specimens are somewhat mutilated we cannot positively say. It differs considerably from Stimpson's short diagnosis of *C. occidentalis*.

Pilumnus lunatus Edw. et Lucas, D'Orbigny, Voy. dans l'Amer. Meridionale, Crust., 20, pl. IX, f. 2; Stimpson, Ann. Lyc., vii, 216.
Heteractæa pilosus Lockington, l. c., Sept. 4, 1876.

The single specimen we have agrees with the short de-

scription given by Stimpson, but we have not had access to the work of Edwards & Lucas.

Pilumnus spino-hirsutus Streets & Kingsley. *Acanthus spino-hirsutus* Lockington, l. c., Feb. 7 and Sept. 4, 1876.

This species is plainly a *Pilumnus* and contrary to the description given by Mr. Lockington of his proposed "new genus" the pre-labial ridge is quite plain.

Callinectes bellicosus Ordway, Jour. Boston Soc'y Nat. Hist., vii, p. 577.
Lupa bellicosa (Sloat MS.) Stm., Ann. Lyc., vii, 57; Lockington, l. c., Sept. 4, 1876.

The specimen sent, a male, agrees well with the various descriptions quoted above.

Achelous panamensis? Stimpson, Annals Lyc., x, 112. *Amphitrite paucispinis* Lockington, l. c., Sept. 4, 1876.

The specimen sent agrees well with Stimpson's description, except in having no spine on the meros joint of posterior feet. There is in this form a spine on the upper margin of the propodus of the first pair, as in *Achelous Gibbesii*, two-thirds the distance from the base to the articulation of the dactylus. Stimpson makes no mention of such spine. The proportions of length to breadth are closely similar. Stimpson gives it as 1:1.87. In this case it is 1:1.82.

Pinnixa longipes Streets & Kingsley. *Tubicola longipes* Lockington, l. c., Apr. 17, 1876.

This is a *Pinnixa*, but differs from the only species (*P. faba* Stm.) hitherto described from the Pacific coast in the greater breadth of the carapax. Mr. Lockington speaks of this as the only case known of a crustacean being commensal with an annelid, but Stimpson (Annals N. Y. Lyceum, vii, 68 and 236) reports similar habits of *Pinnixa chælopterana* and *P. cylindrica*.

Crangon nigricauda Stm., Proc. Cal. Acad., i, 89; Jour. Bost. Soc., vi, 496. *Crangon vulgaris* Owen, Zool. Beechey's Voyage, p. 87; Dana, U. S. Ex. Ex. Crust., i, 536. *Crangon nigromaculata* Lockington, l. c., Feb. 7, 1876.

Nothing but a color variety of *C. nigricauda*.

In addition we have received types of the four following species, but reserve them for further study: *Mithraculus triangulatus*, *Xantho novem-dentatus*, *Xanthodes? angustus*, and *Xanthodes leucomanus*.

In the five papers by Mr. Lockington, quoted above, he describes fifty-eight supposed new species and institutes eight new genera. His *Libinia setosa* is a valid species and has since been redescribed in "Bulletin No. 7" of the National Museum by Dr. Streets as *L. semizonale*. Mr. Lockington's name, however, will hold. *Idotea pulchra* Lockington, is, we are informed by the describer, *I. bicuspidata* Owen. *Idotea marmorata* Packard (Memoirs of the Boston Society, Vol. i, p. 296, pl. viii, f. 6) also appears to be the same.

Concerning the other species described by Mr. Lockington, we have nothing to say. Only by a study of his types can one be sure of what species he had before him. His work, as will be seen by our review of the few of his types that have come under examination, has been extremely careless and untrustworthy. With so little access to the literature of the subject, he should not have attempted systematic work.

FIELD MEETING AT LANESVILLE, WEDNESDAY,
JULY 18, 1877.

THE second field meeting the present season was held at Lanesville, a precinct in Gloucester, this day. The place of gathering was at the Congregational Church, which was placed at the disposal of the Institute for the day.

The afternoon session was commenced at 2 P. M. The PRESIDENT in the chair. Records of preceding meeting read.

The PRESIDENT remarked briefly on the former meetings held in Gloucester, and of the interest manifested in the objects of the Society by the people of the place, speaking particularly of the late Rev. S. Barden, the minister of Rockport, and an indefatigable student of the mineralogy and geology of this section of the county.

Mr. JAMES H. EMERTON, who during the forenoon had, with the party under his direction, found many specimens of marine animals, and had arranged them on the tables, explained the structure and habits of several of the species, illustrating his remarks by blackboard drawings. He also showed by the microscope, after the adjournment of the meeting, the eggs of the Monk fish (*Lophius*), and the worms (*Spirorbis*) which make the spiral shells on sea weed.

Mr. CHARLES H. SARGENT, of Gloucester, exhibited several specimens of minerals which he had found while making a survey near by. He gave the localities where found and other information.

Rev. FIELDER ISRAEL, of Salem, and Rev. BYRON G. RUSSELL, of Rockport, spoke briefly in regard to the ob-

jects of these meetings and the benefits accruing therefrom. Mr. Russell expressed the hope that the Institute would hold another meeting in Rockport at an early day ; he said that the people would extend a cordial welcome.

Mr. GRANVILLE P. PUTNAM, of Boston, a summer resident at the Cape, mentioned some of the minerals he had found in his rambles. He also spoke of the algæ of the Cape, and was followed by Mr. JOHN ROBINSON, who continued the subject of the marine plants, alluding particularly to the fructification and growth of the common algæ.

Prof. EDWARD HITCHCOCK, of Amherst, explained some of the Indian relics which were brought in for examination, and made some interesting remarks upon the habits of the aborigines.

Mr. D. B. HAGAR, of Salem, said that one of the chief objects of an Essex Institute field meeting was to awaken a local interest in natural history, and that wherever such a meeting was held, the people of the place ought to get new ideas, and that any man or woman, boy or girl, might, by giving attention to the subject, be the means of starting a Natural History Society. Mr. Hagar spoke in complimentary terms of the hospitality of the Lanesville people who had furnished such ample refreshments, and offered the following vote :

Voted, That the very cordial thanks of the Essex Institute are hereby tendered to Mr. George Barker, Rev. Mr. Toulman, Mr. Lane and other gentlemen of the place, and to the ladies who had arranged so nicely the dinner of the day ; also to the proprietors of the Congregational Church for the use of the church and chapel for the various exercises of the day.

The vote was unanimously adopted.

CONTRIBUTIONS TO THE MYOLOGY OF TACHYGLOSSA
HYSTRIX, ECHIDNA HYSTRIX (AUCT.).

BY J. W. FEWKES, PH.D.

I HAVE enjoyed the opportunity of dissecting a single specimen of that rare and highly interesting mammal, *Tachyglossa hystrix*. The specimen was given to me by the Museum of Comparative Zoology at Cambridge. Especial attention has been paid in this dissection to the myology of the head and neck, as it is my impression that the descriptions of the muscles of these parts by others are more or less unsatisfactory. I add a more detailed account than has yet appeared of the more important deeper layers of that complex cutaneous muscle, the Panniculus carnosus. A description of these muscles is all the more interesting, considering that they play such an important part in the movements of the fore-leg.

To this is added a new interpretation of certain muscles of the fore and hind limbs, and a description of muscles of the tail, and digits of the fore and hind legs, which appear to have been thus far unnoticed.

MUSCLES OF THE HEAD.

The descriptions which we have of the muscles of the head of this abnormal animal are very meagre and few in number. The work of Duvernoy, "De la langue considérée, comme organe de prehension, &c." (Mem. de la Société d'Hist. Nat. de Strasbourg, 1830), seems to be the first attempt to figure and describe the muscles of the

head and tongue of this animal. This author gives three figures of the tongue, and the lingual muscles, but does not make mention of other important muscles of the head, as those of the jaw, the Masseter, the Pterygoid, Temporal and the Digastric.

From the similarity in function of the tongue, in the Ant Eater and Tachyglossa, it would be a cause of wonder if the myology of the head of the Ant Eater by Owen did not prove of the greatest value. Although the difference in systematic position between these two animals is great, the muscles of the tongue, at least, are in many respects quite alike.

In the valuable paper on the Myology of the Echidna *Hystrix* by St. George Mivart (Trans. Linn. Soc., 1866), the muscles of the head and neck were only in part described. The specimen, from which the dissection was made, had its head destroyed in a trap, and on this account he failed to make out the myology of these parts.

From the character of the mouth and face of Tachyglossa, we should expect that the muscles of these parts of the head would be wanting or very slightly developed. I have been unable to discover any trace of the different facial muscles, Orbicularis Oris, Depressor Angulis Oris, Zygomaticus Major and Minor. In the tough skin, which covers most of the bill, in advance of the orbital foramen, there are muscular fibers, which may represent these, and other facial muscles. To determine their homologies, however, would be a very difficult task.

The muscles of the jaw are the Temporalis, the Masseter, Pterygoideus Externus, and Pterygoideus Internus. To these may be added a Digastricus, which, like the same muscle in many other forms, passes directly from its origin to its insertion, without passing under the slip at the hyoid bone.

M. Temporalis.

This is small and fan-shaped, and arises from the whole inner surface of the posterior part of the orbital foramen. It is inserted into the coronoid process of the lower maxillary bone. The front margin of this muscle may be seen through the orbital foramen, just back of the eye. The insertion at that part of the jaw, which corresponds to the coronoid process, is directly above that of the most superficial slip of the Myloglossus. The length of the muscle is about 10 . Its function is similar to that of the Temporalis in human anatomy.

M. Masseter.

The Masseter is a small muscle of almost quadrangular shape, with a muscular origin and insertion. Its anterior margin is slightly shorter than its posterior, which lies directly under the curved tube of the ear (meatus auditorius externus) and the distal portion of the Sternomastoideus. The muscle arises from what corresponds to the lower edge of a zygomatic process. This origin begins about half an inch in advance of the anterior edge of the orbital foramen, and extends directly backward for about an inch. It is inserted into a curved line corresponding with a sigmoid notch, extending from the coronoid process to the angle of the jaw. The length of the insertion is about the same as the length of the origin.

There are two Pterygoid muscles, which are well marked, corresponding with the Pterygoideus Externus and Pterygoideus Internus.

M. Pterygoideus Externus.

The Pterygoideus Externus is a larger muscle than

those of the head, which has been already mentioned. When the Temporalis is removed, the Pterygoideus Externus at its upper part is plainly to be seen through the orbital foramen. This is brought about by the fact that the muscle extends forward, from its insertion to its origin, under the Temporalis.

The Pterygoideus Externus arises from a ridge on the orbital foramen, just posterior to the orbit of the eye, and beneath the Temporalis. It is inserted into the anterior part of that portion of the condyle, where a little projection is formed for that purpose, and also the whole internal surface of the condyle of the jaw. This latter part of the insertion is muscular, while the former is tendinous. The origin throughout is by muscular fibers.

M. Pterygoideus Internus.

The Pterygoideus Internus is of a quadrate form, and shorter than the Pterygoideus Externus. It has both origin and insertion by muscular fibers. It arises in advance of the origin of the Pterygoideus Externus, from the walls of the skull. It is inserted into the inner side of the lower maxillary bone, opposite the insertion of the Masseter, extending from the angle of the jaw, to the point directly under the coronoid process.

M. Digastricus.

The homologue of the Digastricus is very well shown on a superficial dissection. It arises from the temporal bone, directly in front of the opening of the meatus auditorius externus, on the under side of the skull. Its origin is by muscular fibres. From its origin it extends to its insertion on the posterior aspect of the angle of the jaw, posterior to the ridge, upon which the Masseter finds

its insertion. The action of the muscle is to draw the lower jaw backward, and perhaps to open the mouth by the short lever, whose length is the interval between its insertion and the glenoid fossa. There is considerable doubt whether this muscle can be the homologue of the Digastricus.

The muscles of the tongue are very complicated, and of great size. This fact is directly connected with the varied movements which the tongue has, together with the probable motion of a peculiar structure at its base. The posterior part of the tongue is armed with rows of teeth-like bodies, which also appear on the roof of the mouth above. Their function may be to clear the tongue of the insects which adhere to it, or in a measure to bruise the food before it passes into the oesophagus.

M. Sterno-glossus Superior.

The two Sterno-glossi are the most abnormal of all the muscles of Tachyglossa. When the neck of the animal is opened from the side, there appears a round muscle of about the size of a pipe-stem, which is easily confounded with the oesophagus. This round muscle is composed of the Sterno-glossus Superior and Inferior united together. The Sterno-glossus Superior arises on the under side of the Sternum, and its fibres are continued into the tongue, forming, with its fellow, the interior of that organ. Before it is prolonged into the tongue it is crossed by layers of flat muscles, which extend over it, in front of the posterior portion of the tongue. There is no tendinous part to this muscle. Its width is uniform and about 5^{mm}. Its length from the origin to the base of the tongue is 70^{mm}. The action of the muscle is to draw back the long tongue. The muscular fibres, binding it down at the base of the

tongue, change the action in a way which will be explained further on.

M. Sterno-glossus Inferior.

This muscle acts together with the Sterno-glossus Superior. They both also unite to form the round muscle mentioned above. It arises with the Sterno-glossus Superior, from the under side of the sternum, and is inserted into the base of the posterior part of the tongue. It is very small, with numerous slips of insertion. A slip from the muscle, or a small one bound up with it and the Sterno-glossus Superior, becomes a separate muscle, passing from the larynx to the tongue, and may be known as a Laryngoglossus.

M. Myloglossus.

The Myloglossus is a very complicated muscle and may conveniently be divided into two parts. The first and most superficial part is very thin and arises from the raphé in the middle line, midway between the rami of the lower jaw.

The origin from the raphé is of course connected with the deeper parts of the Myloglossus. The superficial portion is inserted into the lower maxillary bone, just below the Coronoid process, by means of a small tendon. This part of the muscle is fan shaped. A second part of the Myloglossus is much larger, and more important than the one already mentioned. It arises from a common raphé, with its fellow of the opposite side, along the mid-line of the throat, together with an M. Annulus Inferior. It is inserted upon the under side of the skull, in a line extending from the anterior portion of a styloid region, to a point under the angle of the jaw. The length of the attachment to the skull is 20^{mm}. In addition to these two parts of the

Myloglossus there is posterior to them all, a muscle quite distinct, which may be a portion of the Myloglossus. I have, however, described it as an M. Stylo-glossus.

The function of the Myloglossus muscle is to combine with the annular muscle, yet to be mentioned, in pressing the posterior part of the tongue, against the roof of the mouth. The Myloglossus is mentioned by Duvernoy as a Mylohyoid.

M. Stylo-glossus.

Intimately connected with the M. Myloglossus, more especially with its deeper and larger portion, is a Styloglossus. It forms a distinct muscle from the preceding. It arises from the stylo-hyal cartilage at its upper and proximal end; and forms with its fellow of the opposite side, a loop extending to its insertion, in a median raphé behind the Myloglossus, and, superficial to it.

Near its origin it is tendinous. It broadens and flattens as it nears its insertion. Its origin is just back of the ear tube (meatus auditorius externus) above the origin of the Stylo-hyoideus. The length is about 35^{mm}. The function of this muscle is, in part to press the posterior portion of the tongue against the roof of the mouth. In that it acts with the Myloglossus; it may also serve to draw the whole dental portion of the tongue backward, combining its function with that of the Sterno-glossus. It is then an opponent of the Genio-glossi Postici, and the Genio-glossi.

M. Annulus Inferior.

The Myloglossus and Styloglossus act as circular muscles of the throat. Just below the Myloglossus we find a second circular muscle, the Annulus Inferior. This is a broad, thin muscle arising from the raphé, in connection with the more superficially placed muscles, and embracing

the Sterno-glossus. It is inserted by a strong attachment, forming the back of the tongue. In front of the hyoid bone, the muscle has a loose, membranous portion, which in advance of the stylo-hyal forms a part of the back of the mouth. The object of this muscle, is to press the base of the tongue against the roof of the mouth.

It also may, by binding against the Sterno-glossus, form a firm attachment for the Sterno-glossus, on the posterior part of the tongue. The Sterno-glossus may then act to draw this part of the tongue backward. When the base of the tongue is brought against the roof of the mouth, the Genio-glossi and the Sterno-glossi act in different directions, drawing the tongue back and forth.

M. Annulus Intimus.

A second circular muscle below the Annulus Inferior binds down the Sterno-glossus to the Pharyngo-glossus. It appears to be simply a continuation and enlargement of the proper circular muscles of the tongue. It has an origin from the lateral aspect of the back of the tongue, and also from the base and median, ventral line. It forms a loop, through which the Sterno-glossus acts, firmly binding it in place.

Three pair of muscles serve to draw that portion of the base of the tongue, which is armed with teeth, forward. They belong to the same layer as the Genio-glossi, and the lower seems to be continued into them. Of these three muscles one is inserted into the outer side of the base of the tongue, above the Annulus Intimus. Two also are situated on the inner side of the origin of the same muscle.

To these muscles, I give the names M. Genio-glossus, Posticus Externus, and M. Genio-glossus Posticus Internus.

Below the last mentioned muscle, there is a continuation

of the Genio-glossus, inserted on the inner side of the Sterno-glossus, above the Annulus Intimus.

M. Genio-glossus Posticus Externus.

This is a small muscle without tendons, and has an origin a little in advance of a line drawn from the anterior border of one orbital foramen, to the other. It originates from the Genio-glossus, and in part from the inner edge of the lower jaw, with the M. Genio-glossus Posticus Internus. It is inserted into the outer side of the base of the tongue, at its posterior margin, and just above the outer part of the Annulus Intimus.

M. Genio-glossus Posticus Internus.

This muscle is thinner than the Genio-glossus Posticus Externus. It arises from the same place, but is inserted upon the inner side of the Sterno-glossus in a medial position, just above the Annulus Internus at its inner origin. It lies superficially to the Genio-glossus. Both the Genio-glossi Postici blend so intimately at their origins, that they may both be simply a part of the true Genio-glossus.

M. Rectus Capitis Posticus Major.

This is a very small muscle, which arises from the anterior extremity of the spinous process of the axis, and is inserted into that position of the skull, which corresponds to the inferior curved line of the human occiput. The insertion is more or less tendinous. The muscle does not broaden as it nears its insertion, but its width throughout is about the same. It lies in a groove between the Rectus Capitis Posticus Minor, and the Obliquus Superior.

M. Rectus Capitis Posticus Minor.

This muscle is much larger and broader than the Rectus Capitis Posticus Major. As in the human subject, it lies in the triangle between the Rectus Capitis Posticus Major, and the midline of the neck. It is a broad flat muscle, with origin and insertion muscular. It has a curved origin from the posterior rim of the atlas, and is inserted into the occiput in a curved ridge, just back of, and below the insertion of the Splenius. It is relatively much larger, when compared with the Rectus Capitis Posticus Major, than it is in man.

The Rectus Capitis Posticus Major is very small and, except from its apparent homology to this muscle, does not merit the name which has been applied to it.

M. Obliquus Capitis Inferior.

This muscle is large and of irregular trapezoidal form. It has a muscular origin from the side of the spine of the axis, throughout its entire length, and also from the spine of the third cervical vertebra. Its insertion is also muscular into the lateral process, along its whole length, and opposite the origin of the Obliquus Superior.

M. Obliquus Capitis Superior.

This muscle is smaller than the M. Obliquus Inferior. It has a muscular origin from the transverse process of the atlas, and is inserted just behind and above the opening of the Meatus Auditorius Externus into the skull. This insertion is just above that of the M. Rectus Capitis Anticus Minor. Mivart says, "The Rectus Capitis Posticus Major and Minor, as well as the Obliquus Capitis Superior and Inferior are all normal, but the Obliquus Supe-

rior is large, thick and strong," If I am not mistaken, the Superior and Inferior Obliquus are not normal, and the Superior Oblique, I should not designate as large, thick and strong.

MUSCLES OF THE NECK.

M. Sterno-Mastoideus.

The Sterno-mastoideus is a long muscle of uniform size, nowhere of any great width. It arises, with its fellow, on the midline of the outer surface of the manubrium. It is inserted by a flat tendon, into the side of the skull, in what may correspond to a mastoidal region. Its length is about four inches, and its width about one half an inch.

Owen says that in the *Ornithorhynchus* it is a double muscle on both sides, one portion being superficial to another, deeper seated part.

Each portion arises separately from the episternum and is separately inserted into the mastoid region.

In *Tachyglossa* I find no such condition nor does Mivart make mention of it in the specimen which he dissected.

M. Sterno-hyoideus.

I think that the M. Sterno-hyoideus and M. Sterno-thyroideus may have been confounded by Mivart with the M. Sterno-glossus, which is one of the most marked muscles of the neck, and intimately connected with these two. Such a mistake would be a very natural one, if the insertions were destroyed, as they must have been in the specimen, which he dissected. He says the Sterno-hyoid is continued up, under the larynx, and appears to be continued on, into the Hypoglossus as in *Ornithorhynchus*. I

am also inclined to doubt such a condition, and it seems highly probable to me that the Hypoglossus is in reality a muscle, which I describe as *M. Myloglossus*, not following in that respect, Duvernoy, who calls it a *Mylohyoid*.

M. Stylohyoideus.

A *Stylohyoideus* muscle is largely developed. It arises just behind the base of the tube of the meatus auditorius externus, by means of a tendon, and spreads out forming a flat muscle on the median line of the neck. Along the median line there is a slight groove and raphé. In its anterior portion, the muscle is simply joined, with its fellow of the opposite side. Farther back it is joined to the hyoid bone itself.

M. Stylothyroideus.

The *Stylothyroideus* is a small, delicate muscle, which arises from the stylohyal bone and runs down back of and parallel with the stylohyal and epihyal, and is inserted into the thyrohyal on its posterior and upper border. This insertion is tendinous. The origin from the stylohyal is muscular. The length of the muscle is 17^{mm}.

M. Hyothyroideus.

A broad flat hyothyroid muscle, of quadrangular shape arises from the posterior edge of the thyrohyal and the epihyal, and is inserted into the thyrohyal along the projection extending obliquely from the process, above the insertion of the *Stylothyroid* muscle. It is from 8–10^{mm}. long, and 6^{mm}. broad.

M. Genio-hyoideus.

The *Genio-hyoid* is well marked and answers the de-

scription given by Duvernoy. It is seen upon turning back the Mylohyoideus or Myloglossus, and the Annulus Inferior. It runs along above the Genio-glossus and is inserted into the hyoid bone.

M. Genio-glossus.

The Genio-glossus proper, or, as it might be known in comparison with the Genio-glossus Posticus, the Genio-glossus Anticus, has an extensive origin along the inner edge of the ramus of the lower jaw, from the Genio-glossus Posticus to within a short distance of the symphysis of the jaw. The muscular anterior part of the origin ends at a point 35^{mm}. distance from the tip of the snout. The muscle also has a firm attachment to the thick membrane which forms the floor of the mouth, and is attached firmly to a large muscle that lies underneath it and in the interval between the tongue and the lower maxillary bone, from a little in advance of the condyle, to the end of the jaw. The Genio-glossus is inserted into the median raphe of the posterior part of the tongue, below the broad insertion of the Genio-glossus Posticus Interus. The general shape of the Genio-glossus is that of a very obtuse angled triangle, whose larger angle is at a point of its insertion into the inner side of the lower maxillæ, under the origin of what I have named a Genio-glossus Posticus Interus, about 10^{mm}. in advance of the coronoid process of the lower jaw.

Mm. Splenius Capitis et Splenius Colli (?).

The muscle which I identify as a Splenius Capitis is in two parts, one superficial to the other, but so distinct are they, that we might call them Splenius Capitis Inferior and Superior. The most superficial arises from the lat-

eral parts of the fourth to the seventh cervical vertebræ, and in part by fibres from the first dorsal vertebræ. Another origin is tendinous from the midline of the neck upon muscular fibres of the other side, and not from the processes of the cervical vertebræ. This portion combines with the other origin and is inserted by a broad aponeurosis on the occiput on a line above the insertion of the Trachelo Mastoid, extending forward obliquely to the middle line of the top of the skull. The fibrous insertion gets shorter and shorter, and on the medial line of the head it becomes muscular.

M. Splenius Capitus Inferior (?).

Just below the preceding we find another large, flat muscle which may be a part of the Splenius Capitis, or a new muscle, Splenius Capitis Inferior.

It arises from the median dorsal process of the axis, and is inserted directly below by a muscular and somewhat tendinous insertion into the occiput, from the median line to the neighborhood of the insertion of the Trachelo-mastoid, and a little behind it. Both muscles are large, thin and well marked.

M. Laryngoglossus Superior.

The Laryngo-glossus Superior forms the back part of the muscular mass just in advance of the hyoid bone (base hyal, epi hyal) and also of the larynx. It extends from the back of the base of the tongue to the larynx. Its origin is intimately blended with that of the Laryngoglossus Inferior. The length of the muscle is about 20^{mm}.

Laryngo-glossus Inferior.

This muscle lies inside of the Laryngo-glossus Supe-

rior and just posterior to the Sterno-glossus Superior; it is very easily seen when the neck is opened from the ventral side. A thin superficial muscular layer covers more or less of the inner part of the head between the rami of the lower jaw and the front of the insertion of the Sterno hyoid. It is inserted on the inner side of the lower jaw below the insertion of the Temporal and in advance of the Masseter.

DEEPER MUSCLES OF THE PANNICULUS CARNOSUS.

The whole back and sides of the animal are covered with a thick cutaneous muscular mass, in which are embedded the spines. This is known as the Panniculus Carnosus. Its fibres are inserted into the bases of the spines, and by this means the spines, are elevated or depressed. The Panniculus is firmly united with the skin, and is thickest upon the sides of the body. As it approaches the head and extremities the Panniculus becomes much thinner, and the direction of the muscular fibres more uniform. The Panniculus is firmly attached to the head and ulna. Passing from the inner surface of the Panniculus Carnosus to different parts of the fore-leg and neck, we find certain deeper portions of the muscle, which I have deemed worthy of a description, and name.

M. Dermo Dorsi Cervicalis.

The Dermo Dorsi Cervicalis is a long thin muscle, forming, with its fellow of the opposite side, an irregular ellipse upon the back. Its breadth is not uniform; its posterior and anterior ends are broader than the middle portion. The muscle arises from the eighth, ninth and tenth vertebræ and ribs, and from the Aponeurosis of the posterior trapezius. The origin of the fibres nearest the

midline of the back, is about 20^{mm}. from a median line, and is by a slip which is joined to the eleventh rib.

The muscle is inserted into the Panniculus Carnosus of the neck, spreading into a fan-shaped portion and also united with its fellow of the opposite side.

Fibres of this insertion run down on the sides of the neck. The width of the Dermo Dorsi Cervicalis is about 20^{mm}. Its length is 150^{mm}.

This Dermo Dorsi Cervicalis is probably homologous with those concentric fasciculi of muscles, which Owen mentions in *Erinaceus*, and have the same function, only more limited in nature.

M. Dermo Flexor Antebrachii.

The muscle which Mivart identifies as the posterior part of the Latissimus Dorsi, I consider as simply one of those deeper layers of the skin muscle.

I do this, because, although its origin is the same, or nearly the same as that of the Latissimus of man, its insertion is very different. Moreover at its upper edge it is slightly separated from the anterior part of the Latissimus, by the Dermo Dorsi Cervicalis already mentioned. This muscle is of a triangular shape and quite long. It arises by digitations from the eighth to the thirteenth rib, and is inserted along the Antibrachium, where it unites with the Flexor Carpi Ulnaris. The function of this muscle is to help flex the fore-leg, and is thus an opponent of certain other cutaneous muscles to be described. These muscles which act as flexors of the fore-leg, are necessarily large, considering the fossorial habits of *Tachyglossa*.

M. Dermo Brachialis Anterior.

This acts with the Dermo Flexor Antebrachii as a flexor

of the leg. It is quite conspicuous on a superficial dissection, at its dermal end, lying above the insertion of the Dermo Flexor Antebrachii.

The muscle is fanshaped and has the wider part at its dermal origin. It is inserted into the greater tuberosity of the humerus above the insertion of the Pectoralis Major. The width of this muscle is 15^{mm}.

M. Dermo Brachialis Posterior.

This muscle is smaller than the former, and arises lower down, on the under side of the Panniculus Carnosus. It has the same insertion as the Dermo Brachialis Anterior. The width of this muscle is about 10^{mm}. The insertions of both these muscles are tendinous. Their function may be the same as that of the Latissimus Dorsi, or perhaps they may help in the flexion of the fore-leg.

In addition to these two larger dermal muscles, which I have called Dermo Brachialis Anterior and Posterior, there are others situated very near them well marked, and two in number, with an origin from the Panniculus Carnosus and an insertion, with the common insertion of the Panniculus Carnosus, into the fore-leg. These lie just below and behind the Dermo Brachialis Posterior.

The extensors of the fore-leg, opponents of the Dermo Flexor Antebrachii, are Dermo Extensor Brachialis Intimus, Inferior, and Superior. These three muscles lie one above the other. They arise from the sides of the neck, along the inner surface of the Panniculus Carnosus, and extending downward, are inserted along the ulna, the bones of the wrist and the Panniculus which covers them. These muscles are all of about the same size, 10^{mm}. wide and 100^{mm}. long. The lowest is the longest; its fanshaped insertion into the Panniculus, extends under the Dermo Dorsi Cervicalis, and much higher than the others

in the neck, even to the median line. The deepest of the dermal extensors of the fore-leg, is the Dermo Extensor Brachialis Intimus.

Above it, having a common insertion into the fore-arm and an origin below the Dermo Extensor Brachialis Intimus, about 15^{mm}. distance, are muscular fibres distinct from the former. They form a flat muscle of about the same width as, and shorter than the Dermo Extensor Brachialis Intimus. It may be called the Dermo Extensor Brachialis Inferior. Above this there is a third extensor, shorter and broader than the others. Its origin extends up under that of the Dermo Extensor Brachialis Inferior, and it has a common insertion with the last mentioned muscle, and may be known as the M. Dermo Extensor Brachialis Superior. It is the most superficial of all the layers of the skin muscles which act as extensors of the fore-limb. Above it, however, the direction of the muscular fibres of the Panniculus is the same as that of the muscles already described.

M. Dermo Cervicis Triangularis.

This muscle is of a broad, thin, triangular shape, and connected at its insertion with the Dermo Extensor Brachialis. It arises from the midline of the back, above the anterior part of the Trapezius, and joins its fellow of the opposite side. Its connection over the neck is by means of a thin aponeurosis. It is inserted along with the other dermal muscles of the fore-limb, into the front edge of the ulna. The longitudinal muscle of the Panniculus, which covers the fore-arm, has the same insertion. From it a well marked slip can be separated having an insertion into the Panniculus, alongside another muscle which extends over the external tube of the ear. Its position is such that it is easily confounded with the muscles of the

ear. All the deeper muscles of the Panniculus Carnosus are quite large, and easily to be seen when the great superficial covering of the animal is removed. On the hind-leg there is a muscle, which, from its similarity to the *M. Dermo Flexor Antebrachii*, both in its origin and insertion, I have considered as a skin muscle. It is described by Mivart as a *M. Gluteus Maximus*. I have called it the *Dermo Flexor Cruris*.

M. Dermo Flexor Cruris.

This is quite a large, broad, and elongated muscle, which arises from the aponeurosis, connected with the sacral and last coccygeal vertebræ. Its posterior margin is united with the under surface of the Panniculus Carnosus. The muscle passes downward, narrows and thickens, and ends in a broad, flat tendon, which is inserted into the lower part of the posterior surface of the tibia, on the peroneal aspect, and also into the anterior portion of the same, where it blends more or less with the *Tibialis Anticus*, and other muscles of the leg.

The similarity of this insertion to that of the *Dermo Flexor Antebrachii* into the ulna, is very marked. In a part of the origin, too, it resembles the cutaneous muscle of the fore-leg, since both arise from the Panniculus; the one wholly, the other in part. The muscle which Mivart calls the *Gluteus Medius*, I think may be better known as the *Gluteus Maximus*. He even indicates that this muscle, the *Gluteus Medius*, may be a part of the muscle which he calls the *Gluteus Maximus*, and which I consider a cutaneous muscle and name the *Dermo Flexor Cruris*. It certainly has many resemblances to the *Gluteus Maximus*, and if I am right in my interpretation of the muscle which lies partly above it, the *Dermo Flexor Cruris*, is the homologue of the *Gluteus Maximus*. If, as Mivart

suggests, that is the case, the muscle described by him as a *Gluteus Minimus* is in reality a *Gluteus Medius* and *Minimus* combined. I think there is every evidence that such is the case.

My dissection of the manus of *Tachyglossa* differs considerably from that which Mivart describes and figures. In the first place, he states, that of the five smaller tendons, formed by a division of the great tendon of the *Flexor Communis Digitorum*, all, with the exception of that to the thumb, are bound down by a ligament.

In the specimen which I dissected, the tendon of the pollex passed under a ligament, similar to that of the other digits. The *Abductor Pollicis*, which Mivart describes as "Some muscular fibres" which "arise from the *Trapezius*, and are inserted into the radial side of the *Pollex*," was in my specimen a well developed muscle.

M. Flexor Brevis Pollicis.

A well developed muscle of uniform size, represents in function a *Flexor Brevis Pollicis*. It arises from the combined flexor of the wrist (*Flexor Communis Digitorum*), on the radial side of the flexor tendon of the pollex. It separates from this tendon, passes parallel with it, and is inserted into the radial side of the pollex, proximally placed to the insertion of the tendon of the pollex, which comes from the *Flexor Communis Digitorum*. Its origin from the tendon of the *Flexor Communis Digitorum*, recalls to mind the origin of the same muscle in human anatomy, from the annular ligament.

M. Flexor Brevis Digitorum.

The *Flexor Brevis Digitorum* is represented by a small muscle below the plantar fascia. It arises from a bone

which corresponds wholly or in part to an os calcis, and divides into four parts. The first of these divisions of the Flexor Brevis Digitorum is inserted on the hallux side of the distal end of the metatarsal of the index finger. The second is inserted on the hallux side of the distal part of the metatarsal bone of the second finger, and the third and fourth slips are inserted on both sides of the distal extremity of the metatarsal bone of the third finger. A small slip also goes to the little finger, and is inserted on the hallux side.

**M. Flexor Brevis Minimi Digiti and Abductor
Minimi Digiti.**

A comparatively large mass of muscular fibres which, perhaps, represents these muscles, arises from the tarsal bone of the tibial side of the leg and is inserted into the peroneal side of the digit of the little finger.

Mm. Lumbricales.

Mivart found only four Lumbricales in the manus; one pair arising between the flexor tendons of the index and middle digits, and going to the contiguous surfaces of those digits; another pair arising between the flexor tendons of the middle and fourth digits, and passing to the contiguous surface of those digits. In addition to these four there were in my specimen, two more arising from the under side of the common tendon, between the flexors of the fourth and fifth digits, and inserted into the contiguous sides of those digits. These three pair of Lumbricales can best be found, by cutting the common flexor tendon at the wrist, about an inch from the division into five tendons, and turning the divided tendon backward over the digits.

By carefully dissecting out the *Lumbricales*, they may be found, each pair with an origin on the under side at the point of bifurcation of the tendons, to the appropriate digits. Their size is uniform.

Mm. Interossei.

The results of my dissection of these muscles differ from those obtained by Mivart. Two small muscles arise from the thick tendon of the *Flexor Carpi Radialis*, and pass to each side of the distal phalanx of the pollex. They are inserted by small tendons; one on the radial and the other on the opposite side of the phalanx. Two muscles very much resembling these, but larger, arise from the base of the metacarpal bone of the index, and are inserted in a similar manner to the former, into the distal phalanx of the index. These insertions are also by small tendons on the radial, and opposite surface of the index. Another pair, differing from the preceding, by being more widely separated, and not at all connected at the base, as in the case of those of the index and pollex, arise from below the *os magnum*, and have an insertion into the distal phalanx of the third digit. A small interosseous muscle arises on the radial side of a strong tendon, passing obliquely across the palmar region of the manus. It is inserted into the radial surface of the distal phalanx, of the fourth digit. The oblique tendon, near which, this interosseous muscle lies, is a continuation of the *Flexor Carpi Ulnaris*.

Mivart mentions another interosseous muscle of the fourth digit which I have been unable to make out. As it lies directly under the pair of *Lumbricales*, which he missed in his dissection, or at least has not described, I suggest that he mistook a *Lumbriculus*, for an Interosseous muscle. Situated superficially to the great tendon of the

Flexor Communis Digitorum, there is a small bundle of muscular fibres, not mentioned by Mivart, which I am inclined to look upon as an anomaly. It arises from the surface of the common tendon, a short distance before its division, and passes downward between the tendons of the index and middle digits where its insertion is lost in connective tissue and could not be made out by me.

M. Teres Minor.

Mivart says this muscle appears to be wanting, unless represented by a portion of the Deltoid. I find it well represented in a short thick muscle, which arises from the outer surface of the scapula, just at its base and above the glenoid cavity. This origin is by muscular fibres. It is inserted into the whole surface of the humerus, between the insertion of the Teres Major, the ridge running down from the lesser tuberosity of the humerus, and the head of the humerus itself. v | r

M. Levator Cloacæ.

A small, thin muscle passes from the under side of the cloaca, to the transverse processes of the coccyx. It arises just back of the ischium and above the origin of the Ischio Coccygeus, and passes downward and joins its fellow of the opposite side, just behind the base of the clitoris. Its function appears to be to raise the cloaca, which is about an inch in diameter and runs parallel with the caudal vertebræ, and beneath them.

M. Ischio Coccygeus Anterior.

Just in advance of the Ischio Coccygeus, we find a well marked muscle, more or less tendinous at its insertion, and muscular at its origin.

It arises from the transverse processes of the coccyx just in advance of the Ischio Coccygeus, and is inserted on the upper edge of the pelvis, on the posterior upper edge of the base of the circular ridge, which encloses and forms the acetabulum.

The Rectus Capitis Articus Major, and the Rectus Capitis Articus Minor, the Scalenus, the Complex and the anterior part of the Trapezius have all been correctly described by Mivart. The same is true also of the Traachelo-mastoid.

Constrictors of the œsophagus are well developed. Two of these are well marked.

M. Constrictor Superior.

This constrictor is the largest of all. It is a broad, flat muscle, which arises from the whole length of the hyal bones above the thyrohyal. The muscle is inserted into a median raphé along the front of the neck. Intimately connected with this Constrictor Superior is a flat muscle, which from its position and character, I have identified as a Stylo-pharyngeal. It arises by a broad origin above the Superior Constrictor, *i. e.*, between this muscle and the neck, and is inserted into the median raphé blending with the same constrictor. The Superior Constrictor may thus be regarded as representing both the Superior and Inferior of Anthropotomy. Another constrictor of the œsophageal region arises from the thyroid cartilage, just above a Crico thyroid, and is inserted into the median tendinous raphé of the back of the œsophagus. It is smaller than the Superior which has been already mentioned.

Still lower down, below this constrictor, we have a small muscle which arises from the same tendinous raphé of the œsophagus, and extends downward under the pos-

terior lateral projections of the thyroid cartilage, and is inserted into the cricoid cartilage. This muscle is probably a portion of the lower constrictor, with a very different insertion.

MUSCLES OF THE EAR.

The external Meatus of the ear is a long tube composed of numerous rings resembling very much the rings of the tracheæ. It ends in large flat cartilaginous plate or pinna. The pinna is moved by cutaneous muscles. One of the best marked of the cutaneous muscles of the ear arises from the inner surface of the Panniculus, under the Dermo Extensor Brachialis, and extending forward, passes under the flat pinna of the ear. It then becomes fan shaped and is inserted on the inner surface of the Panniculus of the neck. Another flat, deeper layer of this muscle, with the same function passes over the pinna in a manner similar to that in which the former passes over the meatus auditorius externus. The function of both, seems to be to close the ear. The one by pressing the pinna flat upon the skin and the other by approximating the inner walls of the tube of the ear. In addition to these muscles, we have a set whose function is to move the ear. They have an origin from the Panniculus and are inserted on the projection of the lower part of the upper surface of the pinna.

M. Attollens Aurem.

A very small muscle has for its function the elevation of the ear. It has an insertion into the projection at the lower part of the external surface of the pinna. It is of triangular shape. Its origin is from the Panniculus Carnosus, where it interdigitates with fibres of the Panniculus Carnosus which there have a longitudinal direction.

M. Depressor Aurem.

A Depressor Aurem is much more developed than the Attollens Aurem. It arises from the Panniculus and extends upward to an insertion with the Attollens Aurem on the pinna.

MUSCLES OF THE EYE.

The muscles of the eyes of the specimen which I dissected were in a very poor condition. I was able, however, to distinguish two recti muscles and one oblique, which was possibly an internal oblique. This last was of much greater size and breadth than the others. Their origins and insertions were normal, differing but little from those of ordinary mammals.

EXPLANATION OF PLATES.

PLATE I.

FIG. 1. View of the superficial muscles of the head and neck.

a, Sterno-glossus. *b*, Oesophagus. *c*, Trachea. *d*, Sternum. *e*, Styloglossus. *f*, Myloglossus. *g*, Stylopharyngeus. *h*, Stylohyal. *i*, Superficial portion of the Myloglossus. *j*, Temporalis. *k*, Genio-glossus posticus. *l*, (?) *m*, Sterno mastoideus. *n*, Ear tube. *o*, Masseter. *p*, Annulus inferior. *q*, Sublingual gland. *r*, Aorta. *s*, Genio-glossus posticus Externus. *t*, Genioglossus posticus internus. *u*, *v*, Genio glossus. *w*, Thyrohyal. *x*, Pharynx. *y*, Pterygoideus Externus.

FIG. 2. Palmar surface of the manus with the common flexor tendon cut and held back over the toes.

a, Adductor pollicis. *bbb*, Lumbricales. *c*, Tendon of the Flexor communis digitorum. *oooo*, Interossei.

FIG. 3. Pterygoideus Externus.

a, Coronoid process. *b*, Line of insertion of the Masseter. *c*, Angle of the jaw. *d*, Condyle. *e*, Pterygoideus Externus.

FIG. 4. Muscles of the eye.

aa, Recti. *b*, Longus palpebrarum. *c*, Obliquus internus. *d*, Levator palpebrarum.

PLATE II.

FIG. 1. Dermal muscles of the foreleg.

a, Dermo dorso cervicalis. *b*, Dermo Extensor brachialis inferior. *c*, Dermo Extensor brachialis intimus. *d*, Dermo Extensor brachialis superior. *e*, Dermo brachialis posterior. *f*, Dermo-brachialis anterior. *g*, Dermo flexor antebrachii. *h*, Trapezius. *i*, Panniculus carnosus. *j*, Coraco-brachialis. *k*, Posterior portion of trapezius.

FIG. 2. Deeper muscles of the neck and head.

a, Annulus intimus. *b*, Myloglossus. *c*, Stylo-pharyngeus. *d*, Sterno mastoideus. *e*, Pharynx. *f*, Stylohyal cartilage. *g*, Digastricus. *h*, Masseter. *i*, Superficial portion of myloglossus. *j*, *k*, Genio glossi postici. *p*, Annulus inferior.

FIG. 3. Flexor muscles of the foreleg.

a, Flexor brevis pollicis. *b*, Dermo flexor antebrachii. *c*, Flexor carpi ulnaris. *d*, Coraco-brachialis. *e*, Biceps. *f*, Flexor communis digitorum. *g*, Latissimus dorsi. *h*, Anconeus (?).

REGULAR MEETING, MONDAY, AUGUST 6, 1877.

MEETING this evening. In the absence of the **PRESIDENT**, **Mr. JAMES KIMBALL** was requested to take the chair. Records read.

The following communications were presented by the Secretary and ordered to be put upon record :

SALEM. JUNE 19, 1877.

G. M. WHIPPLE, Secretary of the Essex Institute.

DEAR SIR :

Please make the following record in proper place in your manuscript journal.

That yesterday, Monday, 18th June, 1877, I planted in three small coves of the Ipswich River, at Hamilton, twenty-four seeds of the *Nelumbium luteum*, the great water lily of our southern waters.

The seeds were sent to me by our former townsman, and patron of the Institute, John C. Holmes, Esq., of Detroit, and planted at his suggestion. The seeds were soaked in water five or six weeks, then filed on one or more sides, then imbedded in moist turf and dropped in deep and still water. They were lively seed, for three others of the lot had been proved by sprouting.

GEORGE D. WHIPPLE.

Mt. WASHINGTON, JULY 18, 1877.

DEAR SIR :

I send you by this afternoon's mail a copy of "Burts among the Clouds," being the second copy sold. I was a moment late to secure the first, which goes to Detroit, Michigan, and the third copy to S. Legler prez Vevay, Switzerland. It is a novelty in its way, being the first paper printed on the summit of Mt. Washington, and I trust you will find a place for it in the Essex Institute, and oblige,

Yours respectfully,

ROBERT R. ENDICOTT,
of Beverly, Mass.

Voted, That the thanks of the Society be given to Mr. Endicott for his kindness, and the Secretary was instructed to inform Mr. Endicott of the vote.

**FIELD MEETING AT ASBURY GROVE, HAMILTON,
WEDNESDAY, AUGUST 8, 1877.**

THE third field meeting the present season was held, this day, in this very pleasant grove, a place dedicated by the Methodist denomination, a few years since, for their yearly out-door meetings. Some spent the forenoon in roaming over these grounds and noticing the improvements in progress, the beautifying of the cottages, the erection of new ones, and the construction of avenues and paths. There are now nearly 275 cottages built here, and about 350, including the wooden frames which are covered with canvas at the time of occupancy. Many persons, owning or hiring cottages, occupy them during the season, particularly during the heated months of July and August. There is one week of camp-meeting, usually in August, and religious services on Sundays, which are well attended.

Others visited the botanical places in the woods and meadows adjacent, and collected many interesting specimens.

The afternoon session was called to order at 2.45 o'clock at the preacher's stand. The PRESIDENT in the chair. The records of preceding meeting read.

The PRESIDENT referred to the fact that it was eleven years since the Institute held a meeting in this place, and on this occasion our associate member, James F. Almy, gave an interesting history of the Association, the owners of this grove, and paid a fitting tribute to the memory of Francis Asbury, who came to this country in 1771, the first Bishop of the Methodist Episcopal Church ordained in America, and a zealous missionary for forty-five years until his death, which occurred in Spottsylvania, Va.,

Mar. 31, 1816. A more suitable name could not be selected to designate this place. He also called attention to the desirableness of making a complete collection of printed matter pertaining to Essex county and invited co-operation in this direction.

Mr. JAMES H. EMERTON, of Salem, being first called upon, said that he had found in the woods between the railroad and the grove two spiders of peculiar structure and habits, *Cyllopodia cavata*, whose web is described by Prof. Wilder in the Proc. Am. Assoc. for the Adv. Sci. for 1873, and *Argyrodes trigonum*, which usually lives among the outer threads of the webs of larger spiders, several individuals occupying the same web without interfering with each other or with the owner. These spiders do, however, sometimes live by themselves, and one was found in a web apparently of her own make, between two maple leaves. The spider held herself partly hidden under the upper leaf and below hung her two cocoons of eggs. These spiders resemble in color and size the scales which drop from the pine buds and hang in the webs and are easily mistaken for them.

Several residents at the grove called attention to great numbers of insects going up the trunks of the trees. These were the young of a species of *Psocus*. They live on mould and other microscopic plants and wander over the trees after them in flocks of several hundred individuals. Some persons believed they had been stung by them, but this is improbable, as the insects have no stings and their jaws are short and not adapted for piercing the skin.

Mr. J. P. MAGEE, Secretary of Asbury Grove Association, who was next called upon, spoke of camp meet-

ings, which he said originated by two brothers Magee, one a Presbyterian, the other a Methodist, in 1799, and which have become one of the Institutions of Methodism. The first permanent arrangement of these meetings in New England was at Eastham on Cape Cod, where a meeting was held in 1828. After this time to 1836 three others were held. This year the ground and grove containing ten acres was purchased by an association formed for that purpose, and an act of Incorporation was obtained from the Massachusetts Legislature in 1838. It is called Millennium Grove, and is a most beautiful and attractive spot, and exceedingly well located and adapted for the purpose.

Another was established in 1835 at Martha's Vineyard. It still continues and has grown to be a great city of cottages. This Asbury Grove corporation was established in 1859; the first meeting was held in August of that year and these meetings have since been continued annually in the month of August. During this month there will be no less than two hundred of these gatherings in the different parts of this country; they will be in the interest not only of religion but of temperance and science.

Prof. GEORGE H. DIXON, of Hampton, Va., alluded to the introduced plants from Europe that had been acclimatized here, some of which seem to thrive better in these places of their adoption. He presented a collection of the land and fluviatile shells of England, and made some interesting remarks in relation to the habits and characteristics of several of the species. He spoke of the different strata of shell deposits with the view of showing the importance of a knowledge of the mollusca to the geologist.

Mr. GEORGE D. PHIPPEN, of Salem, said that it gave

him pleasure to come here once more to visit these woods where he had derived so much pleasure in the past. He exhibited and described numerous plants that had been collected during the day; among them may be enumerated the Clethra, the Viburnums and Cornel, several varieties of the Orchis, Mikamia and several species of the compositæ, and others. The introduced plants seem to multiply more numerous than the native, and give the agriculturists the most trouble as weeds.

Rev. E. C. BOLLES, of Salem, said that if Prof. E. S. Morse was here he could have his old enthusiasm aroused at the sight of this collection of shells. He described several of the specimens, and added a few words concerning the transportation of shells, plants, etc., from other lands, and of his own collection of shells of the English coast. On the American coast he had found specimens belonging to the same species as the land snails of England, with certain variations showing that they have become Americanized. The part of the country in which Mr. Dixon happens to be at the present time is particularly barren of both land and fluviatile shells, but more will be found on the coast of Maine. In this world, life swarms about us at every point, and from this fact he drew reflections upon the revelations of life and order, and said that these scientific camp-meetings are intended to diffuse information of nature, just as the religious camp-meetings are intended to spread a knowledge of that Creator from whom religion and all these natural wonders spring.

Hon. ALLEN W. DODGE, of Hamilton, gave some facts concerning Rev. Dr. M. Cutler, and of his predecessor, Rev. Mr. Wigglesworth, both of whom had long pastorates in this town. Dr. Cutler was a remarkable man, not

only in scientific attainments, but political foresight. He was the pioneer in the settlement of Ohio; his influence was conspicuous in the passage of the ordinance of 1787 which made the northwest Territory free forever; and he has conferred great distinction upon the town of Hamilton. He spoke of natural historical pursuits as giving a better idea of the wonders of the Creator.

Mr. JAMES F. ALMY, of Salem, made enquiries regarding the peculiar formation of the land here, resembling the dungeons (so-called) of South Salem, which are generally associated with the glacial period. He said that there were several of these curious hollows between the village and this place. He had something to say about the literature of the Methodists; and gave statistics of its "Book Concern," which begun in 1789, and has become the largest publishing house in America; its seminaries of learning, numbering in 1874, twenty-seven universities and colleges, sixty-nine seminaries and academies, also five theological schools, one of which is in Germany and one in India; and its periodicals, consisting of one quarterly, five monthly and thirteen weekly publications. He spoke of the wide influence which has been exerted by the ablest expounders of the faith. With Mr. Magee he extended a hearty welcome to this society.

Dr. GEORGE A. PERKINS, of Salem, moved the following vote of thanks, which was unanimously adopted:

Voted, That the hearty thanks of the Essex Institute be given to the Asbury Grove Camp Meeting Association for their cordial reception this day, and to the ladies who have so kindly assisted in rendering the visit so pleasant and agreeable.

REGULAR MEETING, MONDAY, AUGUST 20, 1877.

MEETING this evening, the PRESIDENT in the chair. Records read. Correspondence and donations announced.

Dr. J. W. Goodell and Mr. E. L. Sargent, both of Lynn, and Mr. George C. Peirce, of Peabody, were elected resident members.



FIELD MEETING AT MARBLEHEAD NECK, WEDNESDAY, AUGUST 22, 1877.

THE field meeting this day was very largely attended by members and friends. It is almost twenty years since the Institute held a meeting in this locality, and during this interval many changes have taken place, the most important of which is the building of a very fine road around this beautiful peninsula and the laying out of the grounds for sea-side residences, several having been erected.

Mr. J. J. H. GREGORY took some of the party to visit the most interesting of the historic localities of the town. Undoubtedly every one of the party had heard more or less of Marblehead, her hills, streets and ancient buildings, but very few had probably before realized the extent of the town's resources in that direction. The following may be specified: the place where "Flud" Ireson lived, his true character and mode of life; where Moll Pitcher was born; the beach upon which the British soldiers landed from the Frolic when coming to Salem to be repulsed at the North Bridge; where lived Vice President Gerry, Gen. Glover, Col. Lee, and a host of other celebrities; where the first house in town stood, and the beauty

of the location ; where may be found the comparatively well preserved dwelling given away as a marriage present from a fond father to his daughter in 1666. Many courtesies were also rendered by Mr. William D. Northend and Mrs. E. D. Kimball, who are spending the summer at this cool and pleasant retreat. At the close of the rambles lunch was spread in an unoccupied cottage owned by Thomas Ryan, Esq.

The afternoon session was held in a small hall, recently erected by the liberality of the summer residents and friends, at 2.45 o'clock. After the reading of the records of the preceding meeting, the PRESIDENT opened the discussion with allusions to the manner of studying the marine fauna and the various systems of classification based either upon anatomical structure, geological periods or geographical distributions. He spoke of his own experience in collecting specimens some thirty or forty years since, by an examination of the stomachs of fishes, or by the hand dredge from a dory or sail boat, and contrasted the same with the present method, by which, with the use of a donkey engine in a government steamer, extensive collections can be obtained and a vast amount of information elicited.

Mr. JAMES H. EMERTON, of Salem, being called upon, said that during the last month some interesting dredgings have been made in this neighborhood for Prof. Spencer F. Baird, United States Commissioner of Fisheries. In the year 1871 Prof. Baird was appointed by Congress to collect information in regard to the supply of fish in the United States waters, to ascertain the causes on which the fish supply depends, and to see what can be done to increase its value and prevent its waste. Several state governments had already begun the

improvement of river fisheries which had been almost destroyed by dams and over fishing, and one of the principal duties of the U. S. Commissioner has been to aid in this work by experiments in breeding and transporting young fishes, and the introduction of new and promising kinds. In regard to the sea fisheries there exists among interested persons the greatest variety of opinions. Some consider them as practically inexhaustible, while others are equally sure the enlarged market and improved methods of fishing are slowly reducing the supply on the best fishing grounds. In order to collect what is known on the subject, printed lists of questions are sent to fishermen and other persons along the coast and the answers to these are classified and recorded, and the most useful published in the commissioner's reports. Every summer Prof. Baird and several other naturalists visit some town on the coast, and make direct observations on the fishes and other marine animals. As complete a collection as possible is made of the fishes in the neighborhood. The stomachs of fishes are examined to learn on what they feed and a general collection made of all the marine animals and plants. The shallower waters are explored between tides, and the deeper by sounding and dredging. For the latter purposes a government steamer is usually placed at the service of the Commissioner for a month or two.

The dredging is superintended by Prof. Verrill of Yale College, and all the animals collected, except the fishes, are sent to him at New Haven for further study. The first season was spent at Wood's Hole, and the results are published in the Second Report of the Fish Commissioner. The following seasons were spent at Eastport and Portland on the coast of Maine, and at Noank, Connecticut. This year it was decided to explore the fisheries of Massachusetts Bay, and for this purpose Prof. Baird, Prof.

Verrill and Messrs. Goode and Bean of the Washington Museum spent part of July and August at Salem. One of the old stores on Derby wharf was used for the shore work, and a steamer was sent by the Navy department to carry on the dredging. The time was too short to spend much of it on the shallow water animals, and every day, when the weather allowed, the steamer was used for dredging in the deeper water ten to twenty miles from shore in depths of forty to one hundred fathoms. The instrument usually employed is a dredge consisting of an oblong frame of iron about two feet wide, behind which drags a net protected by canvas. After ascertaining the depth and temperature of the water and character of the bottom by sounding, the dredge is lowered and the vessel allowed to drift with the current, drawing the dredge slowly over the bottom and scraping up whatever it meets. After sufficient time, the dredge is hauled in by the help of a steam windlass, and the contents tipped into a sieve hung over the ship's side; the larger animals are picked out and the dirt is washed by a stream of water until the finest part passes through the sieve and leaves the shells and larger objects in sight. The contents of the sieve are then carefully picked over and the animals either put into vessels of clear water, to be carried ashore living, or into alcohol. On smooth bottoms a larger kind of dredge, called a trawl, is used. This consists of a net fifteen or twenty feet wide at the mouth, the upper half of which is attached to a beam supported at the ends by runners, while the lower half is weighed down so as to drag on the bottom. The net has, along the sides, pockets in which fishes trying to escape find themselves entangled. In the trawl not only the bottom fishes, but all the animals that are not buried in the mud, are brought up. Sometimes a stone weighing several hundred pounds

gets into the net and needs all the strength of the engine and crew to get it on board, but it usually has quantities of small animals attached to it that pay for the trouble. On muddy bottoms a dredge is sometimes used with a rake attached in front of the mouth, the rake stirs up the mud, and the worms and mollusks are washed out of it into the net. On a rocky bottom even, where it is too rough for the dredge, a tangle is used. This consists of bunches of untwisted rope fastened to chains, by which they are drawn over the bottom, sweeping up the rough echinoderms and crustacea as with a mop. The animals hold on to the hemp and are so brought to the surface.

By these various methods, in the course of a fortnight, over three hundred species of animals were obtained, among them several rare fishes and many other animals of entirely new species. A complete list of these is promised by Prof. Verrill for the Society's BULLETIN, and we shall then have as complete a knowledge of the deep-water fauna of our bay as before of the waters north and south of it.

Prof. GEORGE H. DIXON, of Hampton, Va., described some of the plants that had been collected, including the *Melilotus*, which the English cattle are very fond of, though the cattle here leave it intact. The *Crataegus* belonging to the same family as the English Hawthorn was exhibited, also several species of grasses. The Golden Rod was held up as an object of admiration, there being in England but one of the forty varieties that are known. He then read a piece of poetry which he had picked up that morning, giving an interesting description of the manner in which salmon go up the river to spawn. In England there is a very heavy fine for the taking of salmon during the spawning period; and he was glad to see an

effort for similar legislation in this country. He spoke of the evidence of glacial action to be seen all around here, and also of the history of our race, involving the origin of the human species. He had no doubt, that when the Mosaic chronology was better understood, it would be found that revelation and science agree, notwithstanding the evidence of man's existence goes back to so remote a period as to frighten the theologians, who fear damage to the Mosaic record.

Rev. A. B. HERVEY, of Troy, N. Y., spoke of the marine flora of this vicinity. We have three kinds of rock-weed here, and Marblehead is set down as having the distinction of possessing one kind not found anywhere else, though he had never succeeded in finding it. Mr. Hervey had brought with him some pressed specimens, exhibiting the striking beauty of their formation and expressing surprise that so few people make collections in this department of our flora. Some of the most beautiful of these are parasitic varieties. He also exhibited the tools with which he made his collections, with the view of aiding the efforts of others in the same direction. He described the process of pressing, substantially as follows: Float out each specimen by itself in salt water, in a wide dish, like a washbowl. Put the paper under the plant in the water, arrange the plant on the paper and carefully draw it out. Lay the paper with the plant upon it on drying paper and spread over it a piece of white muslin. Then spread over this a layer of drying paper, then more plants, and then more cloth, drying paper, etc. Put all under a board, and weight it with forty or fifty pounds of stone or other heavy substances. The next day, change the cloths and drying paper, and in one day more the plants will be dry and ready to go into the herbarium or the album for permanent preservation.

Mr. JAMES J. H. GREGORY, of Marblehead, exhibited geological specimens collected on the beach, to illustrate the geology of Marblehead. There are here many varieties of porphyry rocks, the greenstone rocks, and the sienite. He described the chasms along the shore, or the trap dykes. We have here the old Indian quarry, from which the aborigines constructed their implements. In proof of this he described the appearance of the rock, which had obviously been chipped and not so left by any natural action. He spoke of the value of these rocks for building purposes, and of the former agricultural productiveness of this neck, rendered so by the use of sea manure, the soil being naturally as poor as any in Marblehead.

Rev. JOSEPH BANVARD, of Neponset, followed with congratulations of the day, the place, and the presence of ladies. Without professing to be a scientist, he gave expression to his love of nature and of the pleasure he had derived from gathering, thirty or forty years ago, when settled in the ministry in Salem, the little knowledge he possessed upon these subjects. Even a little knowledge of these things is good and pleasant.

After some pleasant and humorous remarks from Mr. WILLIAM D. NORTHEND, of Salem, Mr. D. B. HAGAR, of the State Normal School, introduced the following resolution, which was unanimously adopted :

Resolved, That the hearty thanks of the Institute are hereby presented to the proprietors of the hall, for the free use of the same on the present occasion. To Thomas Ryan, Esq., for the free use of the cottage, and to all persons who have in any way contributed to the pleasure and usefulness of this meeting ; and especially are thanks tendered to Mrs. Edward D. Kimball, Messrs. W. D. Northend, and J. J. H. Gregory, for their generous efforts in behalf of this gathering of the Institute.

Fig. 3

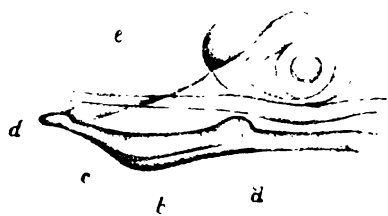


Fig. 4



Fig. 1

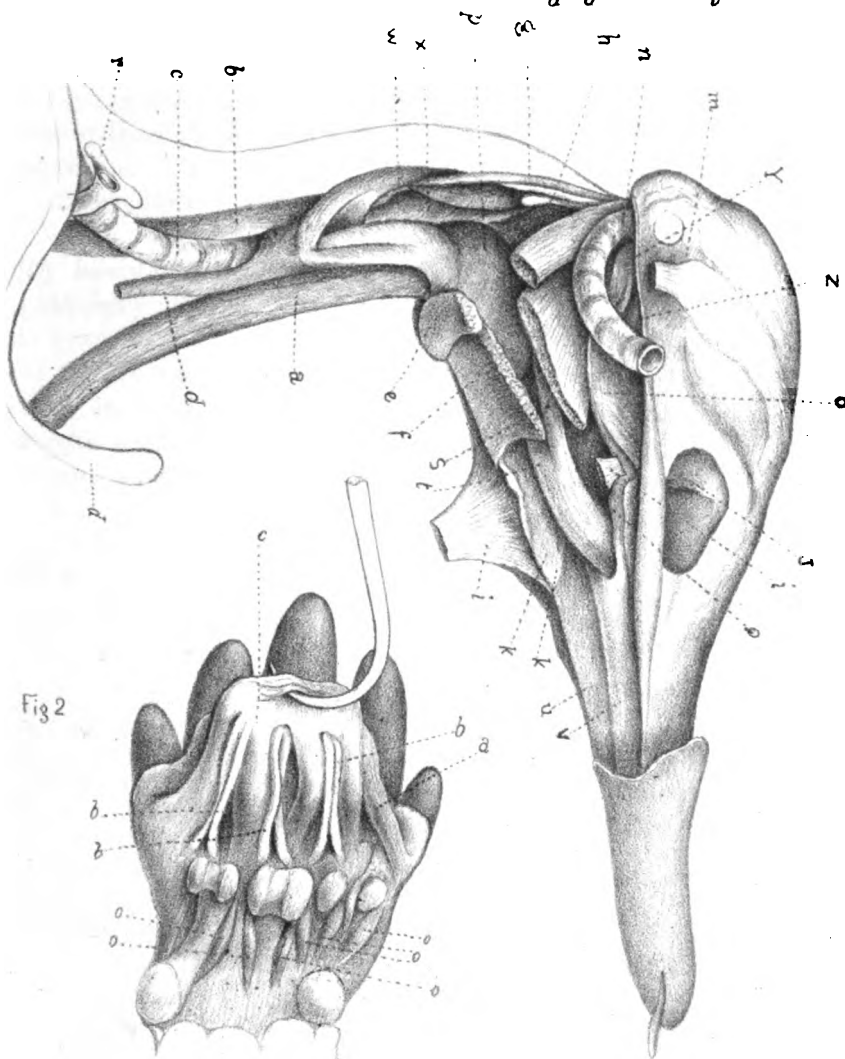
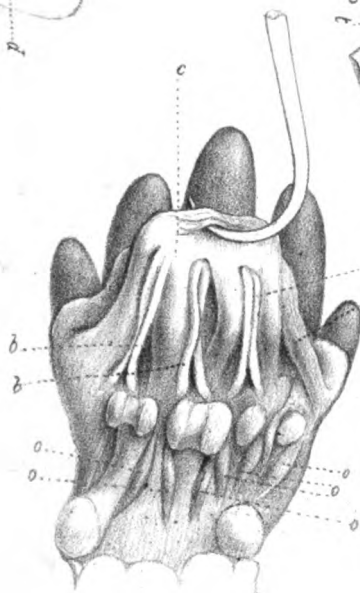
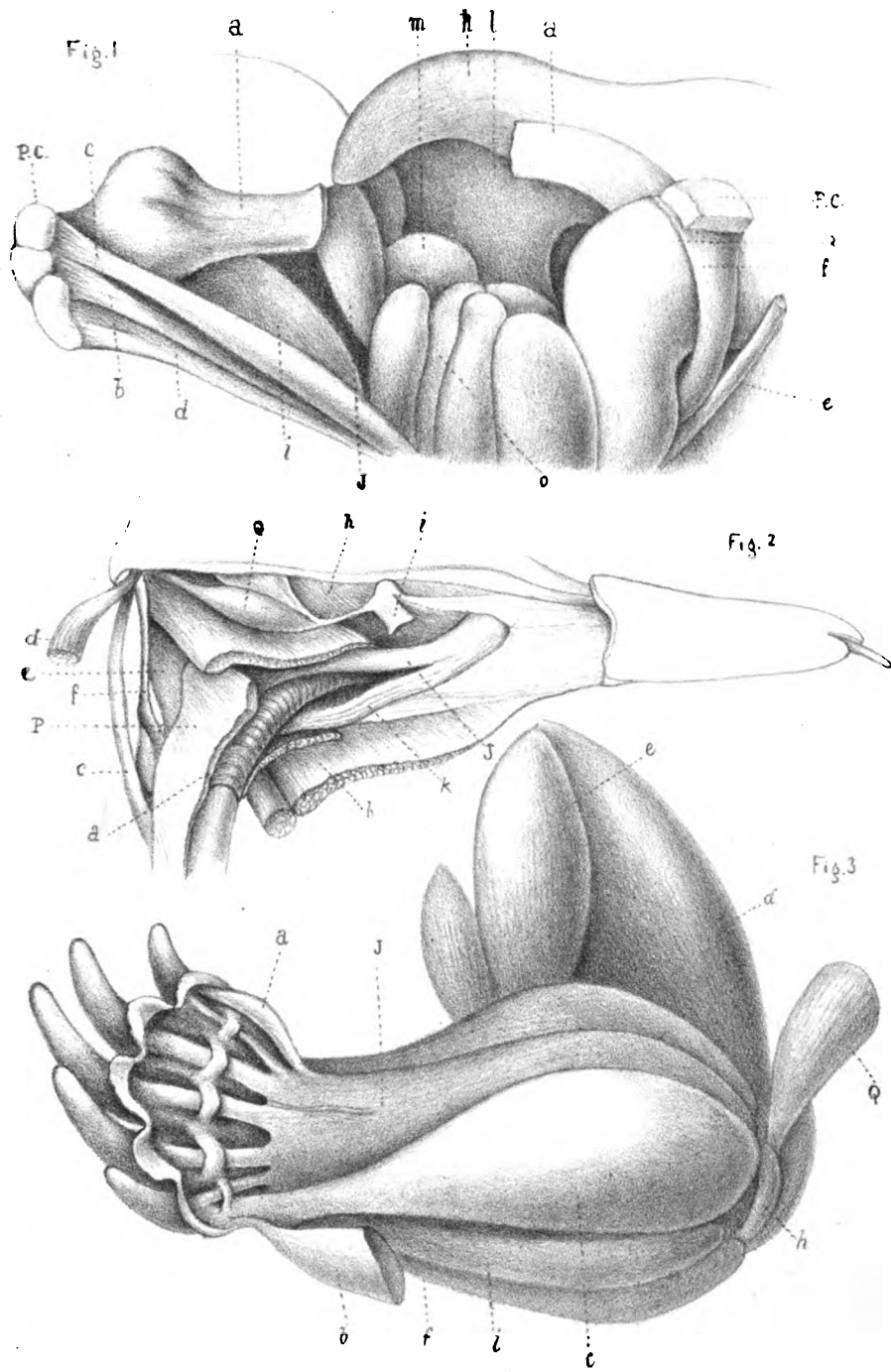


Fig. 2





BULLETIN
OF THE
ESSEX INSTITUTE.

VOL. 9. SALEM, OCT., NOV., DEC., 1877. Nos. 10, 11, 12.

EXCURSION TO THE WHITE MOUNTAINS,
MONDAY, SEPT. 10, 1877.

AFTER the numerous preliminary announcements of this excursion, the Institute party, numbering more than one hundred members and friends, left Salem this morning at ten minutes past seven by the Salem & Lowell Railroad, and arrived at the Fabyan House at a quarter before five on the afternoon of the same day, under the auspices of the Boston, Concord, Montreal & White Mountains Railroad, a continuous and unbroken line, without change of cars, though made up of four or five distinct roads, the seat of management being at Plymouth. On this occasion the party was accompanied by Mr. I. A. Whitcomb, the travelling agent of the line, who was unremitting in his attentions, cheerfully responding to all enquiries, and volunteering a good deal of information as to localities and scenery.

Though this is not the shortest and quickest route to the mountains, it is no disparagement to any to say that

there is no other which combines so many natural attractions. From Lowell up through Nashua, Hooksett, into and beyond Concord, the ride is along the banks of the beautiful Merrimac, which Whittier has immortalized in verse, and which finds its outlet into the ocean at Newburyport, through the northern part of the county of Essex. Very soon after, the region grows a few shades more hilly, and attractive scenery is developed between Northfield and Tilton; thence to the western border of Lake Winnipiseogee, passing and stopping at Laconia, Lake Village, Weirs, and Meredith, a region whence came a considerable number of thrifty and energetic New Hampshire people who have settled in Salem within a score of years past. The party dined at the Pemigewasset House at Plymouth. Advancing northward, the hills grow bolder, but the soil appears indifferent till the valley of the Connecticut is reached at Haverhill, where the ride along the banks as far as Woodside presents a more luxurious aspect of soil and vegetation. Thence ten miles to Littleton, where the stages connect with the Franconia Mountains. Wing Road is a few miles farther on, and at this point the course sharply diverges from the north to an eastwardly direction over the Mount Washington Branch Road, which runs along the valley of the Ammonoosuc through scraggly woods relieved by frequent clearings. The clear tracts are extremely picturesque, and from the hotels dotted among them very fine views of the mountains may be obtained.

In the immediate vicinity of Fabyan's, where the night was passed, are a grave stone and monument to the memory of Ethan Allen Crawford, who built and maintained the first house at the White Mountains. He died June 22, 1846, at the age of fifty-two. He was born, therefore, eighty-three years ago, and within that time

great changes have been witnessed in the travel of this region.

TUESDAY, SEPT. 11.—The main portion of the party left this morning for the Crawford House, four or five miles distant, and spent the day among its many attractions. This is one of the loveliest and most homelike spots in the mountains. A large number rode to the Willey House,¹ and other places of interest were visited.

Some of the party ascended Mount Washington in the forenoon, going to the Crawford House in the afternoon. There was formerly a stage ride of a few miles from the Fabyan House to the mountain railway station at the base. Within a year or two, however, the inevitable railway train, with its puffing locomotive, has penetrated the woods, and it now follows the Amonoosuck along its winding way and in the direction of its source, the grade at the last part of the distance being so very steep as to render friction propulsion something to marvel at. Among the curiosities at the summit is a daily paper, well printed and full of mountain gossip. An edition of from 400 to 1000 copies has been regularly issued and sold. Every one visiting this region buys a copy to send home. The temperature was very mild and comfortable

¹ Among the present Institute party, was Mr. S. P. Richardson, of Salem, accompanied by his brother-in-law, Mr. Bowker. It was a matter of more than ordinary interest to Mr. Richardson, as he visited the Willey House, that his father, Rev. Phineas Richardson, in the year 1826, while settled at Lower Gilmanton, N. H., went through this section on horseback, with saddle-bags, in the interest of the Baptist denomination, and under the auspices of the New Hampshire Baptist Convention, as a preacher in destitute places. He stopped with the Willey family just two weeks before they were destroyed by the avalanche, and read with them out of the same Bible that is still preserved in the house. Every reader, we presume, knows that the Willey family, and two persons in Capt. Willey's employ, were destroyed by a slide while trying to escape from their house, which proved to be the only place of safety. There were other slides in the mountains at the same time. They occurred during one of the most terrible storms that ever swept through this region—one, probably, that has never since been equalled.

and the view good, though there was the common haze lurking in the distance.

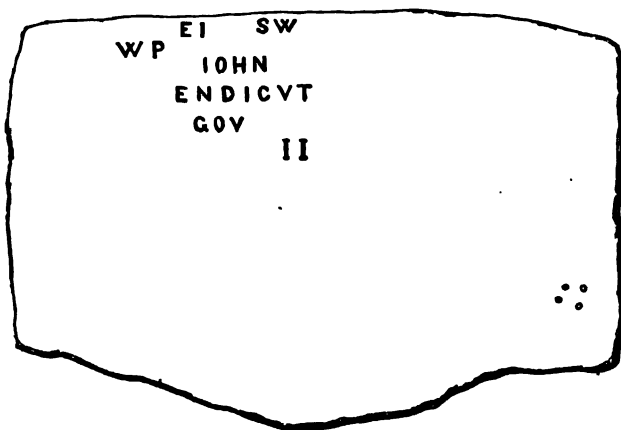
In the evening the Institute held a meeting in the drawing-room of the Crawford's, commencing at eight o'clock. The usual preliminary business of the Institute meetings having been suspended, the **PRESIDENT** said :

The Essex Institute seldom holds a meeting beyond the limits of Essex County. It is a local institution, and its objects are the collecting and preserving materials that will elucidate the natural and civil history of the county of Essex, and also the promotion of the arts, literature and science, by its meetings, lectures, publications, exhibitions, etc.

On several different occasions, it has deviated from the usual course and held meetings elsewhere. In August, 1867, at Kittery, Me., to visit, among other places of interest, the mansion once owned and occupied by Sir William Pepperell—a wealthy and enterprising merchant of the middle of the last century, who aided by his means and individual services in the raising of an expedition for the taking of Louisburg. This enterprise was crowned with success, and he was rewarded with a Baronetcy from George II. He was the first person born in New England who received this honorable distinction. Portsmouth and its surroundings, Kittery and Newcastle, are rich in associations connected with the Colonial and Provincial periods of our history. In 1870, a visit was made to Plymouth, Mass., where was noticed the rock on which the forefathers landed, and the interesting historical relics in Pilgrim Hall. In 1875 a pilgrimage was made to Concord, Mass., where life was first sacrificed in an open resistance to British arms,—the opening drama in the Revolution; and also where we could stand beside the

grave of Hawthorne, that brilliant star in the field of letters, born and for many years resident in Salem, and died near by, at Plymouth, N. H., in May, 1864.

The northern boundary of the colony of the Massachusetts Bay, as defined in the charter of 1628, is three miles north of the northernmost part of the Merrimack river. The General Court, on the 31st of May, 1652, appointed Capt. Symon Willard and Capt. Edward Johnson a committee to ascertain this point. On the 1st of August, 1652, Messrs. John Sherman and Jonathan Ince were selected as the surveyors, who, with two Indian guides, explored the river as far as the Great Fork. By the advice of the Indians, they took the eastern branch, and soon reached the Great Lake; and here, near the Weirs, they placed upon a large flat rock the following inscription, which was discovered some time since, and may now be seen :—



This is not the most northern point. The western branch, which is the Pemigewasset river, takes its rise from the southern slope of the White Hills, and the most

northern of the sources of the numerous rivulets that form so many of the beautiful cascades and waterfalls is the true limit; and three miles due north would not be far from our place of meeting.

The several grants made by the General Court of Massachusetts, north of Haverhill, were considered as belonging to Essex County.

The claims of New Hampshire, on a patent by Capt. John Mason, in 1629, under the common seal of the Council of Plymouth, which conveyed the land from the middle of the Merrimack River and thence northward along the coast to the Piscataqua River, and up the same to the farthest head thereof, and through the Merrimack to the farthest head thereof,—were in conflict with the grant of Massachusetts, and caused a long controversy as to jurisdiction, not affecting, however, individual rights.

Owing to the unsettled state of affairs, the two Provinces were united from 1641 to 1680, and even afterwards the same person would be frequently Governor of both Provinces; so that for many years no serious difficulties arose. But afterwards it was deemed best to have the northern line defined. In 1737 commissioners were appointed, and it was decided that the northern boundary of the Massachusetts line should be a line three miles from the mouth of the river at Newburyport, thence parallel with the river as far as the Pawtucket Falls, thence west to the New York line. In 1740 His Majesty, by the concurrence of the Council, adjudged and ordered this boundary.

On this occasion it is meet that we should pay a tribute of respect to the memory of WILLIAM OAKES, the most distinguished botanist in New England in his time, and one of the founders of the Natural History Society, and for many years a Vice President. A native of Danvers, a

graduate of Harvard in the class of 1820, admitted to the Essex bar in January, 1824; then removed to Ipswich to practise the profession, from which, after some two years, he retired, not finding the duties congenial to his feelings, and devoted his time entirely to the study of natural history, more especially to botany, which had been fostered and developed during his collegiate life by Professor Peck, the Massachusetts Professor of Natural History in Harvard. Not long afterwards he confined his attention almost solely to the New England flora, seldom, if ever, herborizing beyond the limits. There is scarcely a New England plant which he has not collected with his own hands, and prepared an abundance of surpassingly excellent specimens.

As early as the year 1830, he, in company with his friend Dr. C. Pickering, had already explored these mountains, and had projected a flora of New England. The appearance of Dr. Beck's book, in 1833, caused him to abandon this scheme, which he afterwards resumed with increasing ardor, and upon a more elaborate scale. To this end he had collected much.

In the autumn of 1842 he was solicited to prepare a catalogue of alpine plants, to be appended to the final Report of Geology of New Hampshire. Although he had frequently visited and examined this flora, he again went to the mountains. The subject grew upon his hands, —the geology, mineralogy, and zoology alike claimed his attention. He employed artists to make drawings not only of the plants, etc., but of the views and scenery, of rare faithfulness and accuracy. He published, in 1848, a volume which may be considered as the introductory part of the work, entitled, "Scenery of the White Mountains, with sixteen plates, from the drawings of Isaac Sprague; by William Oakes." Boston: Little & Brown,

1848. Small folio, 16 1-2 by 12 inches. Soon after the last proof sheet of this work had been sent to the printer, he suddenly died, on the 31st of July, 1848. He was a man of great generosity, and never hoarded his immense collections, distributing freely to those who would appreciate them. Professor Edward Tuckerman has given the name of Oakes to a highly interesting evergreen, detected some thirty years since in several localities along our eastern coast (*Oakesia Conradi*), which is figured in the memoirs of the American Academy.

Although he had collected much, he had done little towards a final elaboration of the results of his observations, which is attributed to a fastidious taste, and an over anxious desire to satisfy the ever increasing demands of science, and to realize his own high standard of perfection. He published a catalogue of plants of Vermont appended to Thompson's History of Vermont, and some articles in magazines.

OLD RECORDS OF PENNYCOOK AND RUMFORD.

Since the adjournment of the meeting, the following extracts from the first volume of the records of Concord, N. H., have been copied and are here inserted as confirming that portion of the above remarks which relates to the old New Hampshire towns. The General Court of Massachusetts passed March 4, 1733-4, an act for erecting a new town within the county of Essex, called Pennycook, by the name of Rumford. In 1765 this name was changed to Concord, and is now the flourishing capital of New Hampshire.

Pennycook, January ye 9, 1732.—The Inhabitants of the Plantation of Pennycook are hereby notified to assemble and convene at the meeting-house in Pennycook on the eleventh day of this instant January at nine of the

clock in the Forenoon, then and there to choose a town clerk, selectmen and constables and all other ordinary town officers, which officers when chosen are to stand to the anniversary meeting in March next.—BENJA. ROLFE² by orders of the General Court.—A True Copy examined by Benja. Rolfe, Town Clerk.

ESSEX, ss. *Pennycook*, January 11, 1732.—By virtue of the Order from the General Court have notified the Inhabitants of the Plantation of Pennycook of the within mentioned meeting by setting up the within notification at the meeting house in Pennycook. BENJA. ROLFE. A True copy examined by Benja. Rolfe, Town Clerk.

January 11, 1732-3.—*Voted*, That one hundred and ten pounds be raised for the support of Rev. Mr. Timothy Walker.³

Pennycook, March 6, 1732-3.—*Voted*, That there should be twenty shillings paid for the encouragement of killing of wolves, for the year ensuing, within the Township.

Voted, That there should be six pence paid for the encouragement of killing of Rattlesnakes within this Township, for the year ensuing, provided that the destroyers of such snakes shall bring in a black joynt of the tail or with the tail to the selectmen or any of them. A penny

² Benjamin Rolfe, who is referred to in the old New Hampshire records, was a son of Henry Rolfe, Esq., of Newbury, who was one of the original proprietors of Pennycook. He was born in 1710, graduate of Harvard in 1727, chosen one of the proprietors and grantees of Pennycook in 1731, and continued in the office during the several changes of Rumford and Concord, till 1770. He held every important office in the gift of his fellow citizens, and had acquired a large property. At the age of sixty he married Sarah, daughter of Rev. Timothy Walker, some thirty years his junior. He died Dec. 21, 1771. His widow, Sarah, married in 1773, Benjamin Thompson, afterwards distinguished as Count Rumford.

³ Rev. Timothy Walker, the son of Deacon Samuel Walker of Woburn, Mass., was born July 27, 1705, graduated at Harvard College in 1725, invited to settle at Pennycook, Oct. 14, 1730. He married, Nov. 12, 1730, Sarah Burbeen, daughter of James Burbeen, of Woburn. She was born June 17, 1701, and died Feb. 19, 1778. He was a revered, faithful and devoted minister to his people, served the town as a wise counsellor on many important occasions, and was justly entitled to the appellation of "the father of the town." He died Sept. 1, 1782, aged 77.

voted for the encouragement of the killing of Black Birds within this Township, for the year ensuing, the head being brought to the selectmen or any of them and burnt.

March 9, 1735.—*Voted*, That Henry Rolfe, Esq., be chosen and desired to assist and joyn with others, that are or may be chosen for to use proper means for to get the county of Essex divided into two counties.

November 7, 1739.—*Agreed and voted*, That Benja. Rolfe, Esq., be chosen to petition the General Court in the name and behalf of the Inhabitants of the town of Rumford, in order to get a country road laid out and made from the town of Rumford to the town of Chester in New Hampshire.

At a legal meeting of the Freeholders and other Inhabitants of the town of Rumford on the eleventh day of June, 1740. The Selectmen regulating said meeting, Benjamin Rolfe, Esq., was elected and deputed to serve for and represent them in the Great and General Court or assembly now convened and held and kept his majesties service at the Court House in Boston.

After the choice of Representative, Capt. Ebenezer Eastman⁴ was chosen Moderator of this present meeting.

Voted, That Benjamin Rolfe, Esq., be hereby desired and empowered in the name and behalf of the Inhabitants of the town of Rumford to prefer a petition to his Majesty, that they may be quieted in their possessions and remain under the jurisdiction of the Massachusetts Bay, or for any other thing that may be thought proper and convenient.

Voted, That Benjamin Rolfe, Esq., be hereby desired and empowered in the name and behalf of the Inhabitants

⁴ Capt. Ebenezer Eastman, son of Phillip of Haverhill, and grandson of Rogers, the first of the name, who settled in Salisbury, Mass., in 1640, was born Jan. 10, 1689, married Sarah Peaslee, of Haverhill, March 4, 1710, a daughter of Col. Nath'l Peaslee. He became an early settler in Concord, where he died July 28, 1748, aged 59. The part he took in the first settlement of the town, the services rendered and the offices of trust and honor which he held will cause his name to be held in grateful remembrance. He went to Cape Breton, March, 1745, in command of a company and was present at the reduction and surrender of Louisburg, June 16 of that year.

of the town of Rumford, to prefer a petition to the General Court, that they would use their interest with his majesty, that said Inhabitants may be quieted in their possessions and remain under the jurisdiction of the Massachusetts Bay or for any other thing that they may thought proper or convenient.

At a meeting of the Inhabitants and Freeholders of the town of Rumford, being legally warned and assembled the twenty-sixth day of September, 1740.

Capt. Ebenezer Eastman was chosen Moderator of this present meeting.

This Town being informed that by the determination of his Majesty in council, respecting the controverted bounds between the province of Massachusetts Bay and New Hampshire, they are excluded from the Province of the Massachusetts Bay to which they always supposed themselves to belong, therefore unanimously *voted*, That a Petition be preferred, to the King's most excellent Majesty, setting forth our distressed estate and praying we may be annexed to the said Massachusetts Province.

Voted, That Thomas Hutchinson, Esq., be empowered to present the said Petition to his Majesty and to appear and fully to act for and in behalf of this town respecting the subject matter of said Petition, according to his best discretion.

Voted, That Benjamin Rolfe, Esq., Town Clerk, be desired and empowered in the name and behalf of this Town to sign the said Petition.

Voted, That Benjamin Rolfe, Esq., be desired and empowered to nominate or make choice of a suitable person to present the said petition to his Majesty and to appear and fully to act for and in behalf of this Town, respecting the subject matter of said Petition according to his best discretion. In case Thomas Hutchinson, Esq., shall refuse the said service or otherwise be prevented doing the same.— [Page 78 and 79 of Records.

Notice is here given to the Freeholders and other Inhabitants of the Town of Rumford that have an estate or freehold in land within this Province or Territory, of

forty shillings per annum at the least, or other estate to the value of fifty pounds sterling to assemble at the meeting house in said Rumford, on Monday, the twenty-ninth day of June current at five of the clock in the afternoon then and there to elect and depute a person (being a Freeholder and resident in said town) to serve for and represent them in a Great and General Court or assembly appointe to be convened held and kept for his majesty's service at the court house in Boston, upon Wednesday the eighth day of July next ensuing the date hereof. Also to grant such sum or sums of money as shall be thought best to enable Thomas Hutchinson, Esq., further to prosecute the affair of our being annexed to Massachusetts Bay, also to choose a surveyor of highways instead of Joseph Hall who refuses to serve in said office. Dated at Rumford aforesaid the 23d day of June 1741.

Joseph Hall,

Constable of Rumford.

By virtue of a warrant from the selectmen of Rumford.
—Page 85.

At a legal meeting of Rumford, 11 Dec. 1744. *Voted* —That Benjamin Rolfe, Esq., be hereby desired and impowered in the name and behalf of said Inhabitants to prefer a petition to his excellency our Captain General, or to the General assembly of this Province for such a number of soldiers which may be sufficient with a Divine Blessing to defend us against all attempts which may be made against us by our enemies.

Voted—That Benjamin Rolfe, Esq., be hereby desired and impowered in the name and behalf of said inhabitants to prefer a petition to his excellency our Governor or to the General assembly of this Province that may be impowered to make choice of some suitable person to serve for and represent them in every session of the General assembly from time to time within this Province.

Voted—That Benjamin Rolfe, Esq., be hereby desired and impowered in the name and behalf of said Inhabitants to represent to his excellency the Governor and General Court of the Province of the Massachusetts Bay

the deplorable circumstances we are in upon the account of our being exposed to imminent danger both from French and Indian Enemies and to request of them of such aids as to their great wisdom may seem fit meet and which may be sufficient to enable us with a Divine Blessing vigorously to repell all attempts of our said enemies. —Pages 98 and 99.

Dr. Wheatland concluded his remarks by introducing Prof. CHARLES H. HITCHCOCK, saying,—“Having thus briefly alluded to the observations of a diligent explorer of these mountains some forty or fifty years since, we now introduce one who is engaged in a somewhat similar occupation as the present accomplished head of the State Geological Survey of New Hampshire.”

Alluding to Dr. Wheatland's reference to the Essex County naturalist, Prof. Hitchcock said that William Oakes was one of the early explorers of these mountains, and did his work in a very thorough and satisfactory way, his preserved specimens of pressed plants being the best prepared of any he had seen.

Prof. Hitchcock then spoke of the mountains in their relation to other parts of the country, comparing the White Mountains of New Hampshire with the Alps and Jura Mountains of Europe. The Alps are a chain of mountains running east and west through the south of France, a part of Switzerland, and across to the Black Sea—terminating with the Balkans (where the Russians and Turks are now fighting), which are really a continuation of the same range. He described the formation of the summits of these mountains and their varied heights, they being also of the same material as our White Mountains—gneiss and granite, chiefly. He also in a very plain way described and illustrated the commonly accepted theory of the formation of mountains, which is by

lateral pressure caused by contraction of the crust of the earth—this side pressure upon the original flat surface pressing the surface upwards as a sheet of paper laid flat upon a table would bulge upward from the centre on being closed in from the opposite edges.

According to the manner and degree of pressure, the appearance of the mountains and their summits is varied ; and in reference to the Alps he spoke of their obtusely pointed summits arranged *en echelon*. The same lateral force that led to this form, also led to fracture in the rocks ; and so, by inversions, what seem to be the newer rocks are really the oldest. The Jura range of mountains is not more than 3000 or 4000 feet in height, and often as uniform and straight as a railway embankment. They are composed of sedimentary substances, as sand and gravel, and are full of graceful curves—the folds being steepest on the side next to the Alps. From this it will be seen that the Alpine mountains are different from the Jura Mountains ; and these represent two systems, with the Switzerland valley formed between.

Now we have these two systems of mountains in eastern America. One extends from Newfoundland to Alabama, and the other from the Catskills in New York to Alabama. Between them is a great valley beginning with the Champlain, then the Hudson, Kittatinny, Shenandoah, Great Valley of Virginia and East Tennessee. In referring to the general shape of the continent, he said the elevated portions are next to the oceans, while the interior parts are depressed. He then described the Alpine features of the eastern mountains,—first, the Newfoundland district with mountains rising 2000 feet ; next, the middle division like that in the midst of what we now are, rising to 6291 feet ; and, third, the mountains of North Carolina, exceeding 7000 feet in height. In the

course of his explanations, he said if the land should sink 200 feet, the middle section would become an island.

Coming to examine the structure of the mountains, we find the characteristics of the Alpine and Jura mountains well represented, and the material very much the same. From the Catskills, away to Alabama, on the western side of the great valley he had spoken of, were the graceful curves and that appearance as of steep embankments. The highest of our Jurassic mountains is over 4000 feet. The eastern range is composed of crystalline schists, with inverted strata.

Prof. Hitchcock spoke of the relations of this mountain mass to the water of the ocean. Probably ages ago these Atlantic mountains approached the Alps in altitude more nearly than now—the sea having, within these ages, encroached upon the land.

Our Jura mountains are properly called Appalachian; and our Alpine portion we can call the Atlantic system—a name suggested forty years ago for that region, by Featherstonehaugh, the geologist.

Dr. WHEATLAND alluded to his first visit to these mountains forty-five years since. At that time a stage coach in one direction every other day,—returning on the intermediate days,—with a few small wayside inns at intervals of some three or four miles, proved a sufficient accommodation for the summer travel. He stopped at Tom Crawford's, a few rods on the other side of the road near the entrance of the Notch. The foundation of that house is now visible. The winter travel was very large—the farmers from northern New Hampshire and Vermont coming in large numbers together in their sleighs with produce to barter in cities on the seaboard.

Eighteen years after he again visited these mountains.

The tide of travel hitherward had so increased that the stages ran quite full from point to point at least once or twice each day, and the Glen House in the Pinkham Notch; the Crawford House through the gateway of the Crawford or White Mountain Notch; and the Profile House in that sequestered nook in the Franconia Notch,—were all in full blast, having acquired a wide reputation. These lovely spots in the mountains maintain the same appearance that they did then, though the hotels have all been greatly enlarged and the railway has badly mutilated the gateway at the Crawford. The nearest railroad connections at that time, however, were at Gorham, Me., on the Grand Trunk road, and Plymouth and Littleton on the present Boston, Concord and Montreal. Connections with the Crawford House and North Conway were only by stage, as is now the case at the Glen and Profile. The nearest approach to easy connection with the summit of Mount Washington, was a projected carriage road on the Glen side—at that time completed for about a mile and a half.

The PRESIDENT then introduced Rev. CHARLES T. BROOKS, of Newport, R. I., as one of a party of three Salem people, two of whom are now living and present at the meeting, who visited these mountains in 1834, on a pedestrian expedition. Mr. Brooks then read the following poem :—

A Mountain Amble on Pegasus, with considerable Pre-amble. Done for, and dedicated to, the Essex Institute, of Salem, Mass. Read at Crawford's White Mountain House, September 11, 1877.

THE learned body gathered here to-day
Will not be greatly startled if I say
Frequent experiment has proved the rule,
That when a stone is dropped into a pool,

The agitation of the surface takes
 The form of circular, concentric wakes,
 Say, *rhythmic wrinkles*, rippling on and on,
 Till, by and by, the expansive force is gone,
 Fainter and fainter grow the rings, and then
 The last gives up the ghost—and stillness reigns again.

So was it, when, one day, your summons fell
 On the still bosom of my mental well,
 To perch in your commodious travelling cage,
 The song-bird of a mountain pilgrimage;
 The watery rhymes forthwith began to run—
 But courage!—What in time has once begun
 (To us may Heaven a good deliverance send!),
 In time (so science shows) will surely have an end.—

The rifle ball revolves awhile, they say,
 Ere from the gun it speeds its fatal way.
 And I remember well—one frosty morning—
 The tinkling engine bell had given its warning;—
 The locomotive wheels slid round and round
 Some moments, yet had gained no inch of ground.

Does not the sun himself take time to rise,
 While a precursive glow lights up the skies?
 And Ocean's gradual deepening floods begin
 With shoals in which a child may wade and swim.
 This means that *Nature makes no sudden leaps*,
 And Art, in this, faithful to Nature keeps.

The wary general, when he sits him down,
 Prepared with patience to besiege a town,
 With slow approach his parallels draws in,
 Till Prudence says: now let the assault begin!

Shakspeare exclaims, Shall then this wooden O
 (Meaning the play-house called the Globe, you know)
 Contain within its small circumference
 The crowded camps of England and of France,
 And fields with terrible helmets bristling o'er
 That did affright the air at Agincourt?
 But did he not a greater wonder know—
 The mighty mystery of that *bony O*—
 That more contracted space that can contain
 Within the walls that fence the human brain
 The very globe of earth itself and all
 That doth inhabit this terraqueous ball?

Friends, I have mountains on the brain — and you
With patient sympathy must help me through.

A famed Dutch tumbler of antiquity
(Old Diedrich says) once made a bet that he
Would jump over a mountain — so, one day,
He started on the run three miles away,
To *get a purchase* by this mighty race;
But when at length he reached the mountain's base,
He sat, to gain his breath, upon a rock,
And o'er the mountain then, at leisure, he could walk.
Scarce less presumptuous to myself I seem
Than that rash wight, before my mountainous theme.
Like him, I pause an instant here, and then
Gird up my loins and journey on again. —

(Friends, these remarks are nothing but the Proem;
Mistake them not, I pray you, for the Poem.
In Eastern lands the temple, as you know,
Is, sometimes, shorter than the portico.
The patient hearer hence some hope may win:
Pre-ambling then no more, we now begin:)

In good old times, ere yet Romance's land
Was gridironed by ralls on every hand;
Or black, fuliginous clouds obscured the blue
And half the landscape's beauties hid from view;
Or pipe of lark or eagle's pibroch scream
Were scared or drowned by shrieks of prisoned steam;
When Nature's quiet voice could yet be heard
In peaceful song of bee and brook and bird,
Inviting man to the unvexed recesses
Of her majestic sylvan wildernesses; —
Then (as old Chaucer says) by easy stages
Did "longen folk to gon on pilgrimages."
In coach or carryall or "one horse shay"
They jogged along the quiet country way;
Or, better still, on horseback rode at ease
With forehead bared to woo the morning breeze.
So rode that pleasant troop whose forms repass
Forevermore in Fancy's magic glass,
Drawn by the spell of *his* exhilarant lay
(The morning-glory of Old England's day),
Who dipped his brush in the enchanting hues

That play and sparkle on the morning-dews ; —
 True sons of merry England, hieing forth
 Along those pleasant lanes o'er Kentish earth, —
Knight, Miller, Franklin, Sumner, Palmer, Clark,
 Good fellows all and each as gay as lark, —
 Each mounted on his palfrey, mare or nag,
 Good cheer behind in bottle and in bag,
 And better cheer in story and in song, —
 As thus in festal mood they jogged along,
 Was it not meet these wights, so blithe and merry,
 Should *canter* leisurely to Canterbury?
 Loitering along the road, perchance, at times
 (As strenuously slow as these, my rhymes).
 For these blithe pilgrim-folk, I apprehend,
 Were not in haste to reach their journey's end.
 Though to a stately shrine their steps were bound,
 Yet all the way was over pleasant ground;
 The holy martyr's tomb they went to seek,
 That oft had holpen them when sore and weak;
 Yet was there not a healing in the trees
 That lined the road, and in the balmy breeze?
 Had Nature's living breath and human tones
 Less power to work a charm than dead men's bones?

But wherefore then do these my wayward rhymes
 Wander to far off lands and distant times?
 One reason may have been — I am not sure —
 That whilom I, in a White Mountain tour,
 From Alton Bay passed down toward Londonderry
 And made a pilgrimage to Canterbury,
 With two good fellows scores of years ago —
 But that was not my only reason — no :
This was my thought — how, in these hasteful days,
 We miss the healing touch of Nature's ways.
 With what a gentle grace her guiding hand
 Would lead us up through Beauty's magic land,
 Up through the Majesty of solemn woods
 To the Sublime of mountain solitudes.
 By beautiful gradations she prepares
 Both soul and sense to climb her heavenward stairs.
 Alas ! we reach, in these degenerate days,
 Her glorious shrines in too ignoble ways !
 With snort of iron steed we wheel along,
 The steam-pipe's fitful screech our only song ;

Old forest-pines, alarmed such sight to see,
 Are startled from their staid propriety.
 And far behind us, as we speed away,
 Lo, how the "green-robed Senators" Chassez !
 Birch-groves in whirling waltz go spinning round,
 The grazing cattle in wild antics bound ;
 And the deep thickets, as our train sweeps by,
 Send forth a scornful hiss or mournful sigh.
 Will not one day the good old times come back,
 And grass again o'ergrow the Iron track ?
 Oh would but for one day some power restore
 The aspect this enchanting region wore,
 When, forty years ago, companions three,—
 A small, select, congenial company,—
 From sultry Naumkeag came on foot to take
 Their fill of Nature's charms in wild Waumbeck.
 Again those sweet and winding ways I tread,
 Where Saco rippled o'er his pebbly bed,
 Or, lost from view awhile, anon was seen,
 Twinkling like silver down some dark ravine.
 Up through the valley's windings, day by day,
 In pleasant chat we sauntered on our way ;
 (Haley, our spaniel, zig-zagging the while
 A lively chase of leagues to every mlie).

The morn and evening walk—the noon-day rest—
 Day's parting salutation in the west—
 "The breezy call of incense breathing morn"—
 The locusts' hum—the rustle of the corn—
 The swinging sign-board of the wayside Inn,
 ('Tis pleasant to remember such *have been* I) —
 The weekly clothes' wash in the mountain brook,
 Beneath the bridge in some sequestered nook—
 The muttering thunder and the pattering rain—
 The hurried fording of the stream to gain
 Yon hospitable hut, and shelter there,
 Till the bright sun broke through the balmy air—
 Then, as we take our onward way once more,
 Earth's billows closing in behind, before,
 The spectacle from some commanding height
 Of such enchantment breaking on the sight,
 That we too felt as if the first were we
 "That ever burst into that silent sea"
 Of mountain pines—these memories throng again
 Upon the soul—a visionary train.

The mountains' great embrace enfolds me round,
 As when I entered first that holy ground.
 Have I not seen the genius of the place,
 Old Abel, patriarch of that giant-race?
 I see that grisly, grim old face once more,
 I hear his welcome at the old inn-door!
 That beetling brow—those stern and steady blinks—
 Had scared full many a catamount and lynx.
 I saw him and could well believe that he
 Had shaken down like apples from a tree
 The cubs, abandoned by the old she-bear,
 That in their fright had sought a refuge there.
 To one who gazed on that old wrinkled face,—
 Where many a mountain-storm had left its trace,
 And age his crow's-foot tracks—seemed it not fit
 That this old Jotun of the hills should sit
 There, like a warder, at the mountain-door
 That leads to yon weird valley, grim and hoar,
 Whose blasted sides and rock-strewn bed had been
 The scene of many a giant-battle din,
 When, frightened by the elemental wrath,
 Bewildered Saco fled his wonted path,
 E'en as from that lone house, the inmates fled,
 Which else had saved them in that night of dread,
 Spared as it was, sole witness of the vale
 To tell the passer by the tragic tale.—

Gone⁵ that memorial of a frightful fate—
 And gone that sentry at the mountain-gate.
 Gone all those giants of the elder days,
 Gone are the good old times and *slow old ways*,
 When step by step the musing pilgrim wound
 His quiet way up through the holy ground,
 Found tongues in trees, songs in the running brooks,
 And wisdom's whispers in the wayside nooks;
 Not, as to-day, by a steam-tempest hurled
 Into the bosom of the mountain-world;
 At morn he sees the breakers with their white
 And gnashing teeth leap up the rocks—at night,
 Far inland hears, hundreds of miles from shore,
 The giant mountain-pine-woods' sea-like roar.

⁵ Not *literally*, but *virtually*, as it stands no longer in its sublime and affecting solitude.

How shall a man in these new-fangled days,
 Go back to the pedestrian's homely ways?
 Where is the five-mile Inn to greet his sight
 With promise of a home at noon and night?
 The *Inns* are out to-day—their day is o'er—
 That institution can return no more.
 Roll back the tide of time—and haply, *then*,
 You may get back the old Inn-life again.
 Where railroads come the inns must disappear;
 No man can stop to taste their homely cheer.
 The old time-colored house whose aged frame
 Leaned fondly to the earth from which it came,—
 That oldest settler that might seem to be
 Coeval with the soil and scenery—
 Is gone; the pilgrim will behold no more
 The old stone fire-place and the sanded floor—
 Will hear no more the well-sweep's cheerful creak—
 No more the faded sign-board's rusty squeak—
 Nor "cloy the hungry edge of appetite"
 With berries, milk and brown bread morn and night,—
 'Tis gone with the old times and the old men,
 And could it, in this rushing age, again
 In its old place and ancient form appear,
 Its wayside welcome who could stay to hear?

No, I do *not* forget what Solomon says
 To him who asks, Why were the former days
 Better than these—O grumbler! he replies,
 Wilt thou the ways of Providence despise?
Pur-blind laudator acti temporis!
 Rise to a better, broader view than this!
 All things are moving towards a blessed goal,
 Descried afar by them of generous soul.
 The rumble of the steam-car seems to say:
 Make in the desert for the Lord a way!¹
 Bring down that which is high—exalt the low—
 He to all flesh His wondrous works will show.

Well, since accept we must both speed and steam,
 Enough to live old times an hour in dream.
 Be thankful for the Present *and* the Past,
 Nor vainly sigh for that which could not last;

¹ This thought is borrowed from a striking and sublime sonnet of Jones Very's.

Each blissful yesterday still lives to-day,
 "A thing of beauty is a joy for aye."

And so, through all the rush and whirl of years,
 The tranquil picture ever reappears—
 Through Breton woods in August afternoons,
 The crags are hung with raspberry festoons—
 The Ammonoosuck, as we stroll along,
 A fourth companion, murmurs sweetest song—
 In evening's glow far over Bethlehem's plain
 Looks a farewell that glorious mountain train.

O what a chain of loveliest landscapes lie
 Visioned in memory's calm unfading sky!
 Forevermore through her mysterious glass
 Franconia's green and graceful arches pass;
 Far through, the mountain walls on either side,
 A soft, aerial apparition glide.
 That strange stone face, so weird and yet serene,
 Looks off into the sky with mystic mien;
 Deep in the woods, hid from intrusive eyes,
 The Silver Lake in virgin beauty lies,
 A liquid mirror, set in frame of green,
 O'er which the softly sighing birches lean.
 And there, in beauty, the Great Spirit smiles
 On the bright lake of the three hundred isles.
 But above all these charms I feel the thrill
 Of that mute mountain-salutation still;
 And standing at their feet once more would fain
 Lift to the ancient hills a grateful strain.

Alps of New England! I salute once more
 Your august foreheads, as in days of yore:
 Once more with youthful ecstasy I stand
 Beneath your spell, within this wonder-land:
 Once more with child-like awe I rest my eyes
 Where your bare brows salute the upper skies;
 Once more with child-like love and joy I greet
 The murmuring streams that cling around your feet.
 My heart bounds up to meet the cascade's leap
 From crag to crag adown the dizzy steep:
 Up to the mountain-top I lift my eye,
 Where, like a silver thread, it hangs on high,
 Anon, a shining snake, I see it glide,
 Sinuous and swift o'er the green mountain's side;

Down the rock-cavern roar—to plunge unseen
 With muffled thunder through the dark ravine.
 The murmuring music of a thousand rills
 That gush unseen among these winding hills,
 Fills all the region with a spirit's voice,
 That makes the reverent listener's heart rejoice.
 "Ye hills, near neighbors of the stars!" I, too,
 With these a filial homage pay to you!
 As these, in clouds, back from the ocean come,
 And fondly cling around their mountain home,
 So to your wooded heights and gushing springs
 My heart a child's warm benediction brings,
 And owns a blessing in the balmy breeze
 That still breathes on me from your ancient trees.

O, brother giants of an elder world,
 Whose mighty fragments round your feet are hurled,
 With foreheads scathed by lightning and by blast,
 With clouds for mantles round your shoulders cast;
 Mute witnesses of immemorial time,
 Ye look upon us from your heights sublime;
 Shoulder to shoulder, evermore ye stand,
 Kings, priests, and benefactors of the land!

Old friends! as I return at this late day,
 My filial tribute at your feet to lay,
 Though many a change has come and much is gone,
 To memory's world forever more withdrawn,
 Though the great world, with all its whirl and din,
 On these, your holy haunts, comes thronging in;
 Though this our driving, levelling age invades
 All sylvan solitudes and sacred shades,
 Though fire and axe have marred the virgin woods,
 Shattered the rocks, and cramped and choked the floods
 (And though the peddler's paint-pot dare affront
 The nymphs of wood and stream with "Sozodont!"),
 Though often Echo's self, affrighted grown,
 Has held her breath, or from man's presence flown.
 Yet oh, how much remains and will remain,
 Which hand of ruthless man can ne'er profane.
 Old battle scars on many a tall cliff's face
 Still show as lines of majesty and grace.
 Untamed, the winds through mountain hollows sweep—
 Untamed, the cataract makes its mountain leap;
 And though unawed by your dread heights sublime,

Above the clouds man's daring engines climb,
 Up to *those* hills his soul must lift its eyes,
 The eternal hills wherefrom life's rivers rise.
 Above him still sounds the loud voice of God,
 When peal on peal the thunder rolls abroad;
 And still the voice of God breathes soft below,
 Where silver-lipped, melodious brooklets flow.
 The glorious outline of yon mountain range
 Shall bless men's eyes till the great final change.

And oh, that beauteous vision seen last night!
 Snatched all too soon from our enchanted sight!
 That rosy mantle o'er the mountains flung,
 In evening's glow for one short moment hung,—
 Was that transparent veil of amethyst
 Woven of sunset hues and mountain mist,
 A fleeting show for man's illusion given?
 Was it a thing of earth, or air, or heaven?
 Upon the mountain's cheek a spirit flush,
 That held our spirits in a reverent hush?
 The farewell of the mountains to the sun,
 As in the West he sank—his day's-race run?
 I know not—but it was a spirit's power
 That touched our hearts in that transcendent hour!

O listen, man, and hear the psalmist sing,
 Still as of old: The mountain heights shall bring
 Peace to the people! Come then ye who bear
 With troubled hearts life's daily load of care,
 Here in the grandeur of the hills baptize
 Your jaded souls, and as ye lift your eyes,
 Your hearts shall be uplifted, ye shall lay
 Your burden down and bear a song away.

O mountains! is it your echoes that prolong
 My endlessly reverberating song?
 But now my harp must cease the strain to pour,
 Though in my heart the hymn can cease no more.
 Hail and farewell! though mine is not the wit
 To read the runes upon your rock leaves writ,—
 The runic rhymes ye whisper to the heart,
 These I may haply, dimly guess in part,
 Though the heart's joy the tongue in vain would tell—
 Thrice blest, I cry once more: Hail and Farewell!

Thus to the mountains having said adieu,
 I owe, good friends, one final word to you.

Mountains are more magnanimous than we,
 And suffer all inflictions patiently.
 But you are human, and I feel to you
 A few explanatory words are due.
 If then my song seems longer than was fit,
 Think, that I had not time to shorten it;
 And if the wagon of my rambling rhymes
 Have seemed a little rickety at times,
 My sole apology for this is found
 In the unevenness of mountain ground.
 But if my work infirm and clumsy seem,
 Then say, too poor a bard essayed too rich a theme.

Dr. GEORGE A. PERKINS was next introduced. He said it was his happy lot to be a companion, in this early mountain experience, of his friend who had spoken and given the poetry of this journey. On the occasion referred to, they started with their packs on their backs, went to Boston, and there took a steamer to Portland, sleeping, as he well remembered, on the dining table, he and his companion having their arms around each others' necks to keep from rolling off. Arriving at Portland, they came on foot through Gorham, Standish, Fryburg and Conway, and up through the Notch, passing over the range of mountains between the notch and the top of Mount Washington, up the mountains and back. Their guide told them he had met a bear the day before, in the road between the Notch and where the Fabyan house now stands—the animal, fortunately, having been in a peaceable frame of mind, and allowing him to pass unmolested. As an illustration of the changed condition of things between that day and the present, he said the bill at the tavern in Conway where the three had partaken of supper, lodging and breakfast, was only one dollar for the three. He remembered stopping one night at the house of a woman in the Franconia Notch, who, without keeping a tavern, often put up travellers over night. In

addition to the lodging, the meals consisted simply of bread, milk, and raspberries. On being asked the price, the woman, with an apologetic air, said she did not wish to be hard, but, considering that the berries were an extra, not included in her usual fare, she hoped it would not be considered unreasonable if she charged them eight cents each instead of her customary price of six and a quarter cents.

On leaving the Franconia Mountains, the party came down through the Pemigewasset valley, through Plymouth, sailing across Lake Winnipiseogee to Alton Bay, then through Gilmanton to the Shaker Village of Canterbury. At the Shaker Village they met with a warm reception at the "Office." An aged woman met them at the door, saying she had been looking for them all day, with the greeting, "Come in, the Lord has sent you; I knew you were coming, for the cock got upon the door-step this morning and crowed three times." This was on a Saturday evening; they remained over Sunday and Monday, and on Tuesday morning started for home by the most direct road through Concord, Londonderry, Methuen, etc., walking forty miles on one day. The whole journey, with the exception of the steam-boating, was performed on foot, and occupied nineteen days in July and August of 1834.

The meeting then adjourned to listen to some excellent music from several members of the party.

THURSDAY, SEPT. 13.—Yesterday morning at about nine, the party left the Crawford for the Profile House, retracing their former course by rail, some leaving the cars at Bethlehem and others going on to Littleton. From both places stage connections were made. Among the elevations of interest were the Agassiz Mountain,

with the house upon it, and the White and Franconia Mountain ranges.

No visitor to the mountains needs to be informed of the bewitching character of the location of the Profile House in the Franconia Notch. While similar in its general character to that of the Crawford, it is more closely hedged in under the shadow of perpendicular mountains and frowning cliffs. The cannon maintains its outlines on the summit of Cannon Mountain, and though generations of men come and go, the "Old Man of the Mountain" still keeps looking off down the valley as if to watch the march of applied science as it works its way into these regions in the form of railways, and the progress of speculative science in its efforts to unfold the mysteries which are hidden among the rocks and the mountains. The attractions about here were abundantly improved by the party, most of whom rode to the Flume; visited the lake at the base of the Old Man's mountain; and tested, with their own lungs and ears, the prime quality of the echo at Echo Lake.

This morning full two-thirds of the party started for home, a few remaining over till Friday. The larger part of those who came away went back to Littleton in the stage, and at that point took the Boston, Concord and Montreal road for home, by way of Lowell. A fortunate few, however, took the stage ride of thirty miles through the Pemigewasset valley to Plymouth. The ride abounded in scenes of magnificence and loveliness. The winding road through the Franconia Notch is shaded by the dense woods through which it passes, and at many points in its delightful curves, could be caught, by looking up and back, views of the steep rocky cliff where the Profile hangs, but the identity of the Old Man's face was lost in the surrounding crags. All through the valley are lovely

intervalles, through which the river glides gracefully on its course towards the Merrimack, into which it flows. The mountains rise in stately grandeur upon either side, and, from time to time, on looking back, the traveller is greeted with views of surpassing magnificence. The finest of these views of the Franconia Mountains is to be seen at a high point in that section of the road which is in the town of Lincoln. This is the view which Starr King considered the finest, and, in this opinion, the ordinary observer would readily concur.



REGULAR MEETING, MONDAY, OCTOBER 1, 1877.

MEETING this evening. The **PRESIDENT** in the chair. Records read. Donations and correspondence announced.

Dr. A. J. Thompson, of Salem, was elected a resident member.

The **PRESIDENT** stated that an invitation had been received from Newport, R. I., to visit that city. After some remarks, it was voted to accept the invitation, and the Secretary was requested to make the necessary arrangements.

The **PRESIDENT**—in behalf of a committee appointed at the annual meeting in May to consider the propriety of commemorating the two hundred and fiftieth anniversary of the landing of Governor Endicott at Salem, which will occur in September of next year—reported favorably to a suitable notice of the event, and that the Hon. William C. Endicott, of Salem, be invited to deliver the address, and to request the coöperation of the City Government

and the citizens generally. After a discussion of the subject, on motion of Hon. WILLIAM D. NORTHEED, it was

Voted, That it is expedient for the Institute to take the initiative in the matter of the celebration, and that the Hon. William C. Endicott be invited to deliver an oration on the occasion. Also that the committee to whom was referred the subject of the said celebration, at the meeting of May 21, be authorized to make further arrangements.

Voted, That the cordial thanks of the Institute are hereby tendered to Prof. Charles H. Hitchcock, for his interesting remarks made at the Crawford House, Sept. 11, on the "Geology of the White Mountain Ranges," and to the Rev. Charles T. Brooks, of Newport, R. I., for the original poem read by him at the same place and time, and that copies of each be requested for publication.



REGULAR MEETING, MONDAY, OCTOBER 15, 1877.

MEETING this evening. The PRESIDENT in the chair. Records read. Correspondence and donations announced.

Messrs. Arthur L. Goodrich and W. S. Nevins, of Salem, and Mrs. S. Towne, of Beverly, were elected resident members.

On motion of Mr. W. P. UPHAM:

Voted, That the thanks of the Essex Institute be tendered to the Rev. C. T. Brooks, Col. T. W. Higginson and Mr. James E. Maurant, of Newport; to Capt. K. R. Breeze and other officers of the Naval Station at Goat Island; to Moses G. Farmer and his assistants; and to the officers and members of the Redwood Library, for their courtesies and civilities extended during the recent visit to Newport.

REGULAR MEETING, MONDAY, DECEMBER 3, 1877.

MEETING this evening. The PRESIDENT in the chair. Records read. Correspondence and donations announced.

Mr. E. B. George, of Groveland, was elected a resident member.

The PRESIDENT spoke of the death of Mr. John C. Lee, for many years a member and an officer of the Institute, remarking upon the assistance given in its early history, and of the zeal and interest he had always shown in its objects, especially in the department of horticulture.

Rev. E. B. WILLSON followed and spoke of Mr. Lee as a parishioner as well as a neighbor, and of his very pleasant acquaintance in both relations. Mr. Willson also alluded to his fondness for nature, particularly of his love of trees, and said that his reading in the latter years was very extensive.

On motion of Mr. C. COOKE :

Voted, That a committee of three be appointed to prepare suitable resolutions of respect to the memory of Mr. Lee, the same to be entered upon the records, and a copy sent to the family of the deceased by the secretary.

Rev. E. B. Willson and Messrs. H. M. Brooks and G. M. Whipple were appointed. This committee was authorized to prepare a memoir of Mr. Lee, for the publications of the Institute, if the same should be deemed desirable.

Resolutions on the death of Mr. Lee :

The undersigned, appointed a committee of the Essex Institute to prepare resolutions expressive of the sorrow with which the Institute has received the intelligence of

the death of John C. Lee, Esq., and of the respect in which his memory is held, offer the following resolutions to be entered upon the records of the Institute.

Resolved, That the Essex Institute has heard the announcement of the death of John C. Lee with unaffected sorrow :—

That by this event it loses one of its honored founders ; a faithful officer bearing important trusts ; a true and constant friend, who has rendered it valuable and continuous service through the whole period of its existence :—

That by his many liberal gifts, by repeatedly procuring liberal contributions from others, and by affording it the benefit of his experience and judgment in the care and management of its funds, he met its pressing need in more than one exigency with a timely and substantial support, placing it deeply in his debt :—

That by the interest he took in its proceedings, the time and gifts he contributed to its collections and horticultural exhibitions, especially in its earlier and forming years, he stimulated a public interest in its objects and its prosperity :—

That, holding in grateful remembrance his gratuitous labors in its behalf, and his large and varied benefactions as a generous and steadfast promoter of its peculiar aims, the Essex Institute at the same time, in common with the whole community, pays honor to his upright character, his strong understanding, his public spirit, his ever ready coöperation in whatever was to be done for the general good of society.

Resolved, That we offer our sincere sympathy to his family in their great bereavement.

E. B. WILLSON,
HENRY M. BROOKS,
GEORGE M. WHIPPLE.

MEETING, MONDAY, DECEMBER 31, 1877.

MEETING this evening. The **PRESIDENT** in the chair. Records read. Correspondence and donations announced.

Mr. E. W. Jacobs, of Peabody, was elected a resident member.

The **PRESIDENT** called upon Prof. E. S. MORSE, who gave, in a familiar manner, a brief account of his recent visit to Japan. He left for Japan on the 19th of last May, and returned on Friday, the 30th of November. The main object of this visit was to study the Brachio-pods, which are found plentifully in Japanese waters. In addition thereto he noticed many of the inside views of Japanese life, from that of the peasant, in the little fishing town, to the highest educated people in the empire. On arrival at Tokio, formerly Yeddo, he was urged to become a professor in the university, and a most liberal offer was accepted. The Government gave extended aid in establishing a zoological station at the mouth of the Bay of Yeddo, and excellent work was done in dredging. Six weeks were thus spent, two Japanese assistants engaging in the researches. He found ample materials and his studies in this direction had been most interesting. He also made careful observations of the Lingula and exhibited some living specimens which he had brought from Japan.

He spoke of the shell-heaps which he examined, and said that the discoveries there will attract attention. He found one or two parts of a human jaw, a few stone implements, and a large quantity of pottery. Some fine photographs of the specimens found were exhibited.

He presented to the cabinet some one hundred and thirty or more specimens of the paper of Japan, includ-

ing the common kinds used in every day life, also the fine grades of fancy paper, wall paper, writing and note paper, etc. He concluded his remarks with brief allusions to the character of the people, their dress and habits of life ; also of the numerous beautiful temples and shrines that are scattered throughout the country, many of them in wild places remote from the cities and towns. Photographs of several of these buildings were exhibited.

A vote of thanks was then passed to Prof. Morse for his interesting and instructive remarks.



Date Due

~~APR 1976~~

~~AUG 1976~~

